EFFECTS OF OCCUPATIONAL HAZARDS AND SOCIAL SUPPORT ON THE EMOTIONAL AND PHYSICAL HEALTH OF BLUE-COLLAR WORKERS

BY

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This dissertation is dedicated to my parents, Ray and Emily Gaines, whose unconditional love and support made my dream a reality.

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Abstract of Dissertation Presented to the Graduate School
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EFFECTS OF OCCUPATIONAL HAZARDS AND SOCIAL SUPPORT ON THE EMOTIONAL AND PHYSICAL HEALTH OF BLUE-COLLAR WORKERS

By

Jean Gaines

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The purposes of this study were (1) to explore physical danger as a workplace stressor, (2) to assess the potential of union support as a complement to or substitute for other forms of social support, and (3) to examine selected linkages in a theoretical model of stress between objective stressors, perceived stressors, strain and social support in a work environment.

The sample for the study consisted of 144 blue-collar workers in a state agency who were represented by a large public sector union. Data were collected via questionnaire during normal working hours. Multivariate analysis techniques were used to assess main and buffering (moderating) effects.

Results indicate that objective physical danger is positively related to perceived danger and that perceived danger is positively related to all four strains (anxiety, emotional exhaustion, physical symptoms and absence). Objective danger was not correlated with strain.

Supervisor support was negatively related to anxiety and emotional exhaustion and co-worker support was negatively related to absence, both in the model where objective danger was the stressor and in the model where perceived danger was the stressor. Supervisor support was also negatively related to physical symptoms in the objective danger model. Union support was unrelated to any of the strains.

Co-worker support buffered the relationship between objective danger and absence. Union support also buffered the relationship between objective danger and absence, but the interaction was positive, suggesting a reverse buffering effect. Under conditions of high union support, objective danger resulted in more absence than under conditions of low union support.

In the perceived danger model, supervisor support buffered emotional exhaustion, but the other two significant interactions were in the opposite direction than predicted by the stress model. Co-worker and union support both exhibited reverse buffering with respect to the perceived danger-anxiety relationship and to the perceived danger-absence relationship, respectively.

In summary, the study found (1) physical danger to be an important workplace stressor for the blue-collar employees in this sample; (2) union support to be unrelated to strain; and (3) support for the objective stressor-perceived stressor linkage, the perceived stressor-strain linkage, and the direct effects of supervisor and co-worker support on strain. There was no support, however, for social support as a buffer between stressors and strain.

CHAPTER I
INTRODUCTION

Stress is currently a concept that is of concern to individuals, to special interest groups, and to both public and private sector organizations. It is also an area of research which has attracted those in numerous disciplines, including psychologists, psychiatrists, physicians, sociologists, anthropologists, physiologists, ergonomists, and organizational behavioralists. Why is stress such a compelling notion to a diverse cross section of the population? Probably because stress is a universally distressing human experience that appears to heavily influence our psyches, our health, and our behavior (Lazarus, 1966).

In the past 10 to 15 years, occupational stress has received an increasing amount of attention. This appears to have been stimulated by several factors. In 1970, the passage of the Occupational Safety and Health Act created national awareness of the workplace as a major contributor to accidents and ill health. A second factor involves the increasing momentum of the "quality of working life" movement which emphasizes the detrimental effects of job stress. Third, an increasing number of empirical studies are linking work stress with physical and mental illness (see House, Wells, Landerman, McMichael, & Kaplan, 1979; Kasl, 1978). In fact, it has been proposed that "stress-related psychological and physiological disorders have become the number one social and health problem in the last decade" (Pelletier, 1977, p. 6). Despite this growing interest in stress, generally, and occupational stress, specifically, the area remains confusing for both practitioners and academicians. A common definition of stress is still lacking (Schuler, 1980), as are standardized measures with which to research it.

The most useful approach to this dilemma would seem to be that suggested by Lazarus (1966). This involves using stress "as a generic term for the whole area of problems that include the stimuli producing stress reactions, the reactions themselves, and the various intervening processes" (p. 27). Thus, stress becomes a general label to define a large area of interest or study, and specific portions of the stress process can be individually identified and described.

A General Stress Model

In reviewing the occupational stress literature, there appears to be more agreement on what constitutes the stress process than on a definition of the concept. A general stress model, adapted primarily from Caplan, Cobb, French, Harrison and Pinneau (Note 1), and House (1974, 1981), is shown in Figure 1. For the past decade, this conceptualization of stress as a process has reflected the prevalent thought in the organizational stress literature (Brief, Schuler & Van Sell, 1981; Cooper & Marshall, 1976; French & Caplan, 1972; Ivancevich & Matteson, 1980; Katz & Kahn, 1978; McGrath, 1982).

Operational Definitions of Process Variables

The general stress model, as depicted in Figure 1, suggests there are two types of stressors, or environmental stimuli, that can potentially activate the process. Objective stressors are characteristics of the environment which can pose a threat to the individual (Caplan et al., Note 1). These can usually be quantified and/or verified by

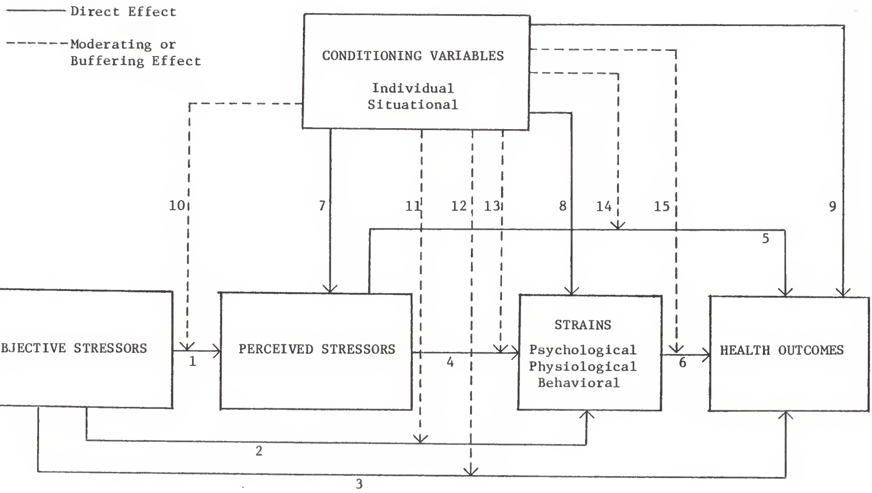

Figure 1. A general model of the stress process (adapted from Caplan et al., Note 1; House, 1974, 1981)

others; examples include noise level in a factory or number and type of verbal interactions engaged in while at work. Perceived stressors result from a cognitive appraisal on the part of the individual as to the nature of the stressors found in the external objective environment. This evaluation process exists inside the person and cannot be directly observed. It is usually inferred by verbal report from the person (Caplan et al., Note 1).

Strain is defined as a response to or consequence of objective and/or perceived stressors. This concept can be thought of as "experienced stress" and is sometimes referred to as an intervening state between stressors and outcomes. Strains can be categorized as either psychological (affective), physiological, or behavioral manifestations of stress. Health outcomes refer to formally diagnosed physical or mental health problems such as coronary heart disease, peptic ulcer, schizophrenia, or depression.

Relationships Among Process Variables

Each of the solid arrows in the model indicates a causal relationship between the variables involved. Objective stressors are hypothesized to influence perceived stressors, strain, and health outcomes directly (Arrows 1, 2, 3). In addition, objective stressors are thought to affect strain indirectly through perceived stressors (Arrows 1, 4), and health outcomes indirectly through both perceived stressors and strain (Arrows 1, 4, 6). Perceived stressors are hypothesized to exert a direct effect on strain and health outcomes (Arrows 4, 5), as well as an indirect effect on health outcomes through strain (Arrows 4, 6). Strain is presumed to influence health outcomes directly (arrow 6).

Conditioning Variables and Their Effects

Conditioning variables are specified as either situational or individual factors which could change or specify the nature of the relationships among stressors, strain and health outcomes (House, 1981). Individual factors include genetic or acquired characteristics of the person such as Type A personality, flexibility, age, or career stage. Situational factors refer to characteristics of the social situation such as highly competitive relationships with co-workers or an extremely supportive relationship with a supervisor. Conditioning variables in this model are hypothesized to exert both direct (main) effects on perceived stressors, strain and health outcomes (Arrows 7, 8, 9), and moderator (buffering) effects on each of the relationships between the process variables (Arrows 10-15). The buffering hypotheses maintain that conditioning variables, such as support from one's supervisor, will have an effect only when the individual is subjected to moderate or high levels of subjective/objective stressors or strain. The hypotheses specifying direct effects indicate that conditioning variables can have important mitigating effects on level of stress perceived, degree of strain experienced and ill health outcomes, even when stress levels are low.

A Stress Model for Current Study

Role of Social Support as a Conditioning Variable

The role of personality characteristics, or individual differences, as modifiers of stress outcomes has received a great deal of attention. For example, there is clear empirical evidence that Type A personalities, described as those having ". . . excessive drive, aggressiveness, ambition, involvement in competitive deadlines, (and) an enhanced sense of time urgency . . ." (Jenkins, Rosenman, and Friedman, 1967), experience increased stress at work and suffer from higher levels of coronary heart disease (see McMichael, 1978). Although information such as this is useful in understanding the stress concept, pragmatically, it is difficult to make major changes in personality characteristics ("train" individuals to be less like Type A's and more like Type B's, i.e., more relaxed, easygoing and less susceptable to environmental pressures) in order to reduce the consequences of stress. In fact, many individual characteristics, such as age, sex, marital status, and job tenure, are difficult to alter. However, social situations are somewhat easier to modify than individual differences, and the impact of their modification is much broader than any intervention undertaken at the individual level.

The notion of social support as a way to situationally moderate the effects of stressors has intrigued those interested in the study of organizations since the early 1970's. Based on the accumulated empirical and theoretical evidence, it appears that social support, or the quantity and quality of one's social relationships with spouses, friends, co-workers and supervisors, can have an important effect on the stressors that are perceived, on the amount of strain experienced, on physical and mental health, and on the likelihood that stressors will lead to a decline in overall well-being (House, 1981).

Purposes of the Study and Research Questions

The focus of the present study will be to further delineate the role of social support as it relates to the portion of the stress process described in Figure 2. Specifically, the purposes of this

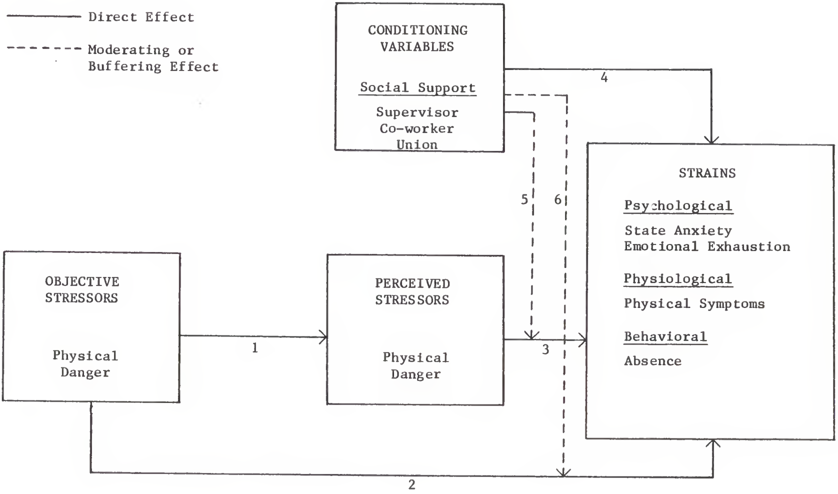

Figure 2. Role of social support as it relates to objective stressors, perceived stressors and strain

investigation are: (1) to assess the direct and indirect linkages between objective stressors, perceived stressors, strain, and social support in a work environment (Arrows 1-4); and (2) to compare the moderating effects of social support at work on the relationships between objective stressors, perceived stressors, and strain (Arrows 5-6).

The research questions addressed by the study include:

1. Is there a relationship between objective physical danger at work and perceived physical danger?
2. What are the effects of objective physical danger on strain outcomes?
3. What are the effects of perceived physical danger on strain?
4. Does objective physical danger only affect strain through perceived danger, or does it exert an independent effect?
5. Do the three social supports affect strain outcomes differentially?
6. Is union support a substitute for or complement to other sources of social support?
7. Is there a moderating effect of social support on the relationships between objective physical danger and strain?
8. Is there a moderating effect of social support on the relationships between perceived physical danger and strain?

CHAPTER II
LITERATURE REVIEW AND STATEMENT OF HYPOTHESES

Stressors: Objective and Subjective

Although there is some consensus in the literature that stress is a subjective phenomenon and that a stressor must be perceived in order to be stressful (Caplan et al., Note 1; Cassel, 1976; Lazarus, 1966; McGrath, 1970), there is an opposing viewpoint that emphasizes the gross neglect of objective stressors and their relationships with perceived stressors, strains and health outcomes (Beehr & Newman, 1978; House, Note 2; Kasl, 1978; Wells, 1982). Kasl (1978) has suggested that the omission of objective conditions has trivialized much of the research on work stress, especially in view of the weak correlations between objective and perceptual measures found in the majority of studies that included both (Coburn, 1975; House, Note 2; Kahn, Wolfe, Quinn, & Snoek, 1964; Kasl, 1973; Wells, 1982). As House (Note 2) points out, "we know little about how, why, and to what extent objective conditions of work, or of life more generally, influence individuals' perceptions of stress . . ." (p. 103).

This dilemma has brought an appeal from several sources (Beehr & Newman, 1978; House, Note 2; Kasl, 1978) for researchers to measure both objective and subjective stressors so that an assessment can be made of: (1) how outcomes, such as strain and health, relate to the objective work environment, and (2) the extent to which perceptual measures are anchored in objective data. In addition, the model used to guide this investigation (Figure 2) also calls for an assessment of the relationship among objective stressors and perceived stressors, strains, and health outcomes. Consequently, both objective and perceived stressors will be used as independent variables in this study.

Danger as a Stressor

There would be little disagreement that danger, either as an objective factor in the environment or as an individual perception, should be considered a source of stress. For many occupations, such as police, firefighters, social workers, craftworkers, utilities workers, nurses, and numerous other job categories, danger could be regarded as a "fundamental task characteristic similar to Hackman and Oldham's (1976) core job dimensions" (Jermier, 1982, p. 199). It is possible for danger to enhance the meaning of work for some because they enjoy the exhilaration of taking risks (Ross, 1974). However, repeated exposure to dangerous situations is likely to produce a sense of chronic uneasiness (Mayer & Rosenblatt, 1975) and eventually lead to anxiety, cumulative fatigue and other psychological, physiological and behavioral strains.

Danger, as it applies to client-centered occupations, has been defined as "exposure to physical or psychological harm" (Jermier, 1982, p. 199). Kroes (1976) developed a similar conceptualization of physical and emotional danger as related to policing. Finally, McGrath (1982) proposed a taxonomy of stressors consisting of physical, psychological, and interpersonal categories of threats. Thus, there appears to be some basis in the literature for differentiating between a physical and a psychosocial component of danger as a stressor.

Psychosocial, or *emotional danger,* can be defined as injury to one's self-esteem or feelings of well-being (Corrigan, Lester & Loftus, 1980; Kroes, 1976; McGrath, 1982). This type of danger involves disrespect and verbal abuse by clients, co-workers or superiors, interpersonal confrontation with citizens, or the observation of tragedy and human misery. Physical danger, the stressor of interest in this study, is defined as exposure to bodily injury, pain or death (McGrath, 1982). This includes such stressors as being assaulted by an angry patient, inhaling poisonous fumes in a factory, or losing a limb to a chain saw. Although both components provide valuable insights into the concept of danger, physical danger, as a task characteristic, seems more generalizable to jobs outside the human service occupations than is emotional danger.

Objective and Perceived Danger

Physical danger may be viewed as a dimension of both objective and perceived danger. In other words, there are objective hazards in the environment, that could be consensually validated by independent observers (Spielberger, 1972), which physically endanger portions of the working population. However, exposure to objective physical danger and the perception by employees of the danger encountered do not always coincide. There are many factors that affect this discrepancy between objective and subjective appraisals, such as familiarity with the source of danger (Ittelson, 1978), a sense of control over the situation, and personal competencies with which to deal with the danger (Rachman, 1978). In addition, it is well documented that occupations which confront danger socially construct their own images of potential danger which may under- or over-estimate actual hazards in the environment (Jermier, 1982; Mayer & Rosenblatt, 1975).

There is currently no empirical evidence on the relationship between objective danger as a stressor and subjective danger. Three studies have obtained fairly strong correlations between other subjective and objective stressors: French and Caplan (1972) and Sales (1970), using descriptions of work load, and Karasek (1979), using measures of job discretion. However, most of the research suggests that there is a weak bond, at best, between objective and perceived workplace stressors (Coburn, 1975; Eden, 1982; House, Note 2; Kahn et al., 1964; Kasl, 1973; Wells, 1982).

Based on the existing theoretical and empirical literature (Coburn, 1975; Eden, 1982; Fitzpatrick, 1980; French & Caplan, 1972; Haas, 1977; House, Note 2; Ittelson, 1978; Jermier, 1982; Kahn et al., 1964; Karasek, 1979; Kasl, 1973; Mayer & Rosenblatt, 1975; Rachman, 1978; Sales, 1970; Wells, 1982), the relationship between objective danger and subjective danger appears to be a tenuous one, and one that is not well understood.

H_1: Objective physical danger is positively related to perceived physical danger (Figure 2, Arrow 1).

Strains: Psychological, Physiological and Behavioral

Psychological Strain

Two variables will be used to represent psychological strain in order to differentiate between short-term, temporary strain and a more long-term, cumulative variety. Transitory or state anxiety can be defined as "unpleasant, consciously perceived feelings of tension, apprehension" (Spielberger, 1972, p. 29) and dread accompanied by an increase in autonomic nervous system activity. This complex emotional reaction is usually elicited by external or internal stimuli that are perceived to be dangerous or threatening by the individual. The intensity of the state anxiety reaction will be proportional to the amount of danger the situation poses and will last only as long as the individual perceives the situation as threatening (Spielberger, 1972).

Although numerous occupational stress studies have used anxiety as an outcome variable, very few have operationalized it as Spielberger (1972) has suggested. Those studies which have defined and/or measured anxiety in alternative ways can be placed in three categories. First, several studies in the early 1970's conceptualized anxiety as job threat (Hamner & Tosi, 1974; Tosi, 1971; Tosi & Tosi, 1970), or as uncertainty on the job and heavy work load (Ivancevich, 1974). A second group of researchers (Brief & Aldag, 1976; Miles, 1976; Miles & Perreault, 1976; Schuler, Aldag & Brief, 1977) utilized House and Rizzo's (1972) anxiety-stress scale, which measures job-induced tensions and pressures as well as physical symptoms and outcomes. Last, in recent years a large number of authors (Andrews, Tennant, Hewson & Vaillant, 1978; Bryant & Veroff, 1982; Coburn, 1975; Coburn, 1978; Eaton, 1978; Gore, 1978; House, Note 2; Lin, Simeone, Ensel & Kuo, 1979; Myers, Lindenthal & Pepper, 1975; Parkes, 1982; Zaleznik, Kets de Vries & Howard, 1977) have measured anxiety with a general health questionnaire such as the Health Opinion Survey (MacMillan, 1957), or a psychiatric symptoms questionnaire such as Gurin, Veroff and Feld's (1960) scale or Langner's (1962) index. These instruments include physical symptoms as well as items designed to screen a variety of psychological problems in addition to anxiety. Consequently, only the studies using state anxiety conceptualizations similar to Spielberger's (1972) will be reviewed.

In 1969, Kohn and Schooler investigated the effects of various organizational stressors on anxiety in a large national sample consisting of 3,101 employed males. The results show that anxiety is positively correlated with closeness of supervision, time pressure, dirtiness of the work, likelihood of "dramatic change," frequency of being held responsible for things outside one's control, and risk of job loss. Kohn and Schooler (1969) conclude by stating that their evidence suggests that job factors have "a substantially greater impact on men's psychological functioning than the reverse" (p. 116), thus implying some degree of causality between perceived stressors at work and experienced strain.

In a study examining both objective and perceived stressors, Sales (1970) found objective and subjective work overload to produce significantly greater tension (anxiety) and anger than underload in 73 male undergraduates. Unfortunately, the combination of tension and anger into a single variable makes it impossible to partial out the effects of the stressors on feelings of tension as a separate entity.

In 1976, Beehr, Walsh and Taber researched the relationship between perceived stressors and job tension (operationalized as anxiety) with 143 members of a white-collar union associated with a large manufacturing company. They reported role overload and role ambiguity to be positively related to tension, but nonparticipation in decision-making to be unrelated to tension.

Caplan et al. (Note 1) tested a stress model similar to the one in Figure 1 and used anxiety as one measure of psychological strain. In this questionnaire study of 2,010 males from 67 different organizations and 23 occupational groups, the results indicated that anxiety levels were not influenced by perceived environmental stressors such as work overload, role conflict and ambiguity or pay inequity. However, Caplan and Jones (1975) found different results in their investigation of the effects of quantitative work overload and role ambiguity on anxiety in 73 male users of a university computer system that was preparing to shut down for 23 days. Measurements were taken of the variables three days prior to the shutdown (T_1) and five months later (T_2). Decreases in the perceived stressors (work load and ambiguity) from T_1 to T_2 were positively correlated with decreases in anxiety. In addition, changes in anxiety were positively associated with changes in heart rate.

In a recent study by Ganster, Mayes, Sime, and Tharp (1982), state anxiety was used as one outcome variable representing psychological strain. A total of 79 counselors in a social service agency were randomly divided into a treatment group (n = 40) and a control group (n = 39). The treatment group received 16 hours of a stress management program, including cognitive restructuring, progressive relaxation, and biofeedback, distributed over eight weeks. The treatment group exhibited significantly lower levels of depression and epinephrine secretion than did the control group at the post-test, but there was no significant difference in anxiety levels between the two groups.

Parasuraman (Note 3) investigated role conflict and ambiguity, quantitative and qualitative overload and inter-unit conflict in a sample of 205 first-line managers. She discovered each of the perceived stressors to be positively related to felt stress, a concept described as synonymous with state anxiety.

Eden (1982) examined the effects of acute objective stressors, operationalized as critical job events, on subjective stressors, state anxiety, and other psychological and physiological strains. The sample consisted of 39 first-year nursing students and the design was an interrupted time series with multiple replications. The results show that anxiety, blood pressure and pulse rate increased significantly just prior to each critical job event and decreased during a relatively tranquil interim period.

In 1983, Shaw and Riskind reanalyzed the Caplan et al. (Note 1) data on stress outcomes and correlated them with the job dimensions from the Position Analysis Questionnaire (PAQ) data bank. The dimension most similar to physical danger, "being in hazardous job situations" (p. 257), did not significantly relate to any of the psychological strains, including anxiety. However, the authors explain that it was difficult to match the Caplan et al. (Note 1) occupational categories to PAQ titles and corresponding job dimensions. This may account for the non-findings on these variables.

In sum, only one study (Shaw & Riskind, 1983) has examined the relationship between danger as a stressor and feelings of anxiety and they found no correlation. However, the previous review suggests there is reason to believe that other job stressors, especially role conflict, role ambiguity and work overload, increase employee anxiety. Only one investigation (Caplan et al., Note 1) found perceived psychological stressors to be unrelated to anxiety and the only attempt to assess the effects of objective and perceived stressors found both related to anxiety (Sales, 1970).

H_{2a}: Objective physical danger is positively related to state anxiety through perceived danger (Figure 2, Arrows 1 and 3).

H_{2b}: Objective physical danger is positively related to state anxiety (Figure 2, Arrow 2).

H_{2c}: Perceived physical danger is positively related to state anxiety (Figure 2, Arrow 3).

The second variable used to represent psychological strain, emotional exhaustion, is defined as a feeling of fatigue, irritability, frustration and wearing out (Maslach & Jackson, 1981). It is considered the central or core dimension of burnout--a type of stress reaction that is conceptualized as a syndrome of emotional exhaustion and cynacism toward one's work caused by exposure to organizational stressors (Maslach & Jackson, 1981; Maslach & Jackson, 1982). In contrast to the more transient, temporary nature of state anxiety, emotional exhaustion captures the chronic, cumulative effects of work stressors on employees. It manifests as a general loss of feeling and concern, trust, interest and spirit (Maslach, 1982a). Employees' emotional resources become depleted and they lack energy to face another day at work (Maslach, 1982b). It is this "prolonged, unabated stress from which the individual has no respite" (Pelletier, 1977, p. 6) that is thought to be primarily responsible for the development of stress-induced psychological and physiological disorders.

Although the burnout concept has been used most frequently to describe the client-centered, human service occupations, emotional exhaustion seems applicable to any group of employees who are exposed to dangerous work. Lauderdale (1982), Maslach (1976), and Mattingly (1977) all discuss the possibility that physical danger associated with the task could increase levels of emotional exhaustion. This would appear particularly significant in low-prestige occupations where exposure to danger does not take on the excitement or glamour that it might with police or fire-fighters.

Very little empirical evidence exists regarding the effects of physical danger on emotional exhaustion. Kafry and Pines (1980) studied the relationship between perceived physical danger and tedium--a concept defined as "a general experience of physical, emotional, and mental exhaustion" (p. 478) with a sample of 205 professionals and 84 undergraduate students. They did not find physical danger to be a significant correlate of tedium in this group and postulated that it may have been, in part, because none of the professions surveyed encountered severe physical danger as a part of their jobs, unlike police officers and firemen.

In a sample of 169 police department employees, Gaines and Jermier (1983) found that perceived physical danger significantly affected emotional exhaustion, but only in interaction with departmental context. Members of the investigations department (detectives) experienced significantly greater emotional exhaustion as danger increased than did service department employees (records technicians and other support personnel). However, it appears that severe physical danger itself does not necessarily produce high levels of emotional exhaustion. Patrol officers reported higher levels of physical danger than investigators, but did not experience more emotional exhaustion as a result. Gaines and Jermier (1983) explain this as possibly due to their acceptance of the fact that patrol work involves risk. Investigators move from patrol partly to avoid risk; when they do encounter dangerous episodes, their reactions may be more severe than patrol officers' reactions. Thus, Kafry and Pines' (1980) assertion that the effects of physical danger on strain vary by occupation may be accurate more because tolerance for danger is conditioned by departmental and/or occupational expectations than because actual exposure to danger varies between occupations.

From the two available studies that examined physical danger and emotional exhaustion, it appears that the relationship between them is a complex one. However, based on several studies that found significant correlations between other perceived job stressors (such as lack of task autonomy, variety and feedback; the presence of rigidly enforced rules; highly centralized decision-making; pay inequity; and lack of promotion opportunity) and emotional exhaustion (Armstrong, 1977/1978; Cherniss, 1980; Gaines & Jermier, 1983; Kafry & Pines, 1980; Maslach & Jackson, 1981), one could predict a positive relationship between physical danger, both objective and perceived, and emotional exhaustion.

H_{3a}: Objective physical danger is positively related to emotional exhaustion through perceived physical danger (Figure 2, Arrows 1 and 3).

H_{3b}: Objective physical danger is positively related to emotional exhaustion (Figure 2, Arrow 2).

H_{3c}: Perceived physical danger is positively related to emotional exhaustion (Figure 2, Arrow 3).

Physiological Strain

The second major category of strain will be represented by the presence of physical symptoms as perceived by the employee. As early as 1929, there was documentation that individuals engage in a "fight or flight" response when faced with stressful situations (Cannon, 1929). This physiological response, which includes an increase in pulse rate, respiratory rate, metabolic rate and blood pressure, prepares the individual for either fighting the stressful stimulus or escaping from it. There is also evidence that "consciously or unconsciously perceived stressors alter neurophysiological activity, endocrine and immunological balance . . . and digestive processes" (Pelletier, 1977, p. 15). This suggests that whether stressors are recognized or not, they significantly alter an individual's resistance to disease and in some cases, create damage in their own right.

Although physical symptoms reported by patients or employees are sometimes devalued in favor of more objective measures such as blood pressure, cholesterol level or blood sugar (Beehr & Newman, 1978), it has long been recognized in the health professions that a comprehensive history (composed primarily of past and present physical symptoms) is the single most important element in establishing an accurate diagnosis (Sherman & Fields, 1974). Prior and Silberstein (1973), in their classic text used in many medical schools to teach physical diagnosis, state that there is no field of medicine in which taking a patient history is not essential. They conclude that "without the history, the physical examination is simply a routine mechanical procedure" (p. 2). Thus, perceived physical symptoms appear to be at least an adequate way to tap physiological strain.

Although no studies were located using danger as a stressor and physical symptoms as an outcome, several investigators have reported the effect of other occupational stressors on perceived physical symptoms or perceived physical health status.

Jacobson (1972) assessed the combined impact of nine physical conditions and demands of work on health status in a sample of 145 male factory operatives aged 55-64 years. The results indicate that job stress, measured independently of the respondents' own accounts, correlated significantly with self-appraisal of physical health obtained in a semi-structured interview setting. Margolis, Kroes, and Quinn (1974), using interview data from a national sample of 1,496 employed persons, found that four job-related stressors were significantly correlated with overall physical health (which was measured primarily by questions regarding physical symptoms). These stressors included underutilization of abilities on the task, inadequate resources to do the job, insecurity about continued employment and lack of participation in decisions affecting the job. Role ambiguity and role overload did not significantly correlate with physical health.

In a mailed questionnaire study done by Coburn (1975) with 780 male workers in varying occupations, physical health was found to be adversely affected by extreme job incongruence. This stressor was defined as having a job that is very complex, frequently difficult to handle, and mentally tiring. The study also suggests that perceived incongruence has much larger effects on health than does objective incongruence, a concept measured here by comparing the listed General Education Development required for jobs by the U.S. Department of Labor with the actual educational attainment of the respondents.

Katz and Kahn (1978) report a study conducted by Gardell (1976) in the Swedish sawmill industry. Three groups of jobs were selected for comparison: a risk group consisting of jobs that were machine-controlled, monotonous and required continuous positional constraints; and two control groups, one skilled and one unskilled. The results show marked differences between the risk group and two control groups on the incidence of headaches, nervous complaints and back ailments experienced. However, gastric ulcer problems were the same for the risk group and the unskilled control group, and only slightly lower for the skilled control group.

Three occupational groups (n = 2,131) within one organization were compared by Zaleznik et al. (1977) on three categories of self-reported physical symptoms--cardiovascular, gastrointestinal and allergy respiratory. Controlling for demographic and sociocultural variables, managers consistently reported fewer physical symptoms in each category than did staff or operations employees. The authors explain these differences on the basis of managers being better prepared to deal with the bureaucratic processes and power dynamics in organizations than are staff and operations people.

In a comprehensive investigation of work and health cited earlier in the discussion on anxiety, Caplan et al. (Note 1) found that two job stressors, underutilization of abilities and discrepancy between the amount of job complexity present and the amount preferred, were related to physical symptoms. However, most of the effects on health were indirect ones through job dissatisfaction. Few direct effects through actual characteristics of the work itself were observed.

In the field experiment discussed previously in the anxiety section by Ganster et al. (1982), subjects were asked to report on the frequency at work of such physical symptoms as dizziness, migraine headaches, nausea, etc. at three different times over a seven-month period. No significant differences were found between the control group and the experimental group at the pre-test, post-test or four-month follow-up.

In a sample of 732 plant operators working on a 28-day rotating schedule, Zedeck, Jackson and Marca (1983) found workers who preferred a shift change to have significantly more self-reported digestion problems, heart problems, and difficulty sleeping than those who were satisfied with their shift. In addition, digestion problems and heart problems were significantly related to general health status in the total group.

Although not all job stressors were found to be correlated with each physical symptom studied, the evidence presented here indicates that there is a consistent relationship in the literature between work stressors and the presence of physical symptoms in employees. Only Ganster et al. (1982) found no significant differences in physical symptoms between an experimental group (that had been trained to deal with stress) and a control group. In the remaining seven surveys reviewed, at least one of the job stressors correlated significantly with one or more physical symptom or with overall health status.

H_{4a}: Objective physical danger is positively related to physical symptoms through perceived physical danger (Figure 2, Arrows 1 and 3).

H_{4b}: Objective physical danger is positively related to physical symptoms (Figure 2, Arrow 2).

H_{4c}: Perceived physical danger is positively related to physical symptoms (Figure 2, Arrow 3).

Behavioral Strain

Employee absence will be used to represent the third major category of strain in this study. The causes (or correlates) of absence behavior have generated much research, although little variance has been explained in the phenomenon. Steers and Rhodes (1978) suggest that this lack of explanatory power may be because there are other variables that influence absence which have not yet been systematically studied. This appears to be a valid conclusion, especially since job stressors constitute a category of variables that have been neglected in mainstream absence research.

Absence could be related to job stressors in at least two ways. Absence has long been conceptualized as employee withdrawal behavior (see reviews by Muchinsky, 1977; Porter & Steers, 1973; Steers & Rhodes, 1978). It is possible that, as Steers and Rhodes' (1978) model suggests, stressors at work affect attendance motivation, and off-the-job stressors influence attendance ability. Thus, stressors could account for a good deal of the variance in the two major variables postulated to affect attendance behavior. In other words, when stress increases, the motivation to attend work decreases and/or the ability to attend decreases. The result is that the employee physically withdraws from the workplace in order to recover.

A second possibility is that absence is not so much a last resort withdrawal from work in response to high levels of stress, but rather is an active coping device on the part of employees who want to stay mentally and physically healthy (Hammer & Landau, 1981; Staw, 1977). Absence is one way of restructuring the boundaries between work and nonwork, thereby maintaining a necessary balance between the two (Johns and Nicholson, 1982). Steers and Rhodes (1978) even suggest that some absence may be "healthy" for organizations because it contributes to the mental health of its employees (p. 403). But, no matter which explanation is chosen, it is clear that absence behavior is for the person "an adaptive or proactive response to the unique configuration of the life space at that time" (Johns & Nicholson, 1982, p. 146).

Although several stress models describe absence as a behavioral strain (Beehr & Newman, 1978; Ivanchevich & Matteson, 1980; Schuler, 1980), very few empirical studies on stress have included it as an outcome. No studies were located relating physical danger and absence.

However, there are numerous investigations that have used predictors that could be classified as job stressors. These fall into three major categories: task characteristics (or unenriched work); role characteristics; and work context factors.

In reviewing the task-related literature, there appears to be a fairly consistent inverse relationship between enriched work and absence. Baumgartel and Sobel (1959), Hackman and Lawler (1971), Hackman and Oldham (1976), and Turner and Lawrence (1965) found autonomy to be negatively correlated with absence behavior. Jobs low in variety were also found to be related to increased absence (Cooper, 1973; Hackman & Oldham, 1976). Results from Hackman and Lawler (1971) and Johns (1978) indicate that task identity is inversely correlated with absence. Three studies used composite scores of job enrichment with Hackman and Oldham (1976) and Mowday and Spencer (1981) concluding that less absence was associated with jobs higher in motivating potential and Spencer and Steers (1980) finding an increase in job challenge to be related to lower absence rates. Machine-paced work also appears to significantly increase employee absence (Fried, Weitman & Davis, 1972; Gardell, 1976), as does low involvement in job-related decisions (Bragg & Andrews, 1973; Karasek, 1979; Nicholson, Wall & Lischeron, 1977). In a related study, Hedges (1973) found that operatives, laborers and service workers had the highest rates of absence, which she partially attributed to boredom on the job.

Although several studies failed to find significant relationships between individual task characteristics and absence, only three studies report contradictory findings. Kilbridge (1961) found repetitive jobs to be associated with increased absence in one organization, but not in the other. He also found that absenteeism was lower for line repetitive work than for batch repetitive work. Hackman and Oldham (1976) report a positive correlation between task significance and absence, but it did not reach statistical significance. In addition, Johns (1978) found increased feedback from the job to be significantly associated with increased absence.

The field experiments reviewed by Mowday, Porter and Steers (1982) involving job redesign interventions show similar results. Seventeen out of 22 studies found that enriching employees' work reduced absenteeism, whereas five did not find such a relationship. In another quasi-experimental study not reviewed by Mowday et al. (1982), Hackman, Pearce and Wolfe (1978) found a positive relationship between jobs that were enriched and absence. The authors explain this anomolous finding by discounting the measure of absence used.

In sum, the evidence on task characteristics suggests that unenriched work, which can be conceptualized as a job stressor, is related to increased employee absence.

Empirical research evaluating the effects of role characteristics on absence is less abundant than that on task characteristics. Margolis et al. (1974), in a national sample of 1,496 employed persons, found underutilization of skills, role overload, resource inadequacy and non-participation in decision making to be significantly correlated with increased absence behavior. However, role ambiguity was not related to absence in this study.

Gupta and Beehr (1979) collected interview data on 651 employees from five different organizations. They measured four job stressors: role ambiguity, role overload, underutilization of skills and resource inadequacy. Frequency of absence was obtained for periods one month prior to the stress measurment and one month after the stress measurement. Results show that none of the correlations between the stressors and prior absence are significant, while all of the correlations of stressors with subsequent absence reach significance. The authors conclude that these role stressors do predict employee absence.

Using a causal model to test the effect of participative decision-making on job stressors and strain, Jackson (1983) conducted a field experiment with nursing and clerical employees in an out-patient clinic. Oucomes were assessed via questionnaire at three months (n = 90) and six months (n = 70). Participation in decision making was found to relate negatively to role conflict and ambiguity. Role conflict and ambiguity were also positively correlated with emotional strain and strain was related to decreased absence. Three possible explanations were offered for the unexpected negative relationship between emotional strain and absence. One alternative is that absence was being effectively used as a coping strategy for preventing strain. Another explanation is that strain may have been high among those who felt they could not be absent because of the heavy responsibility they carried in the organization. A third possibility is that the stressors were emanating from home rather than work, and attendance reflects a withdrawal from the source of strain.

Although the findings from the three studies that examined role characteristics are not perfectly congruent, they do all suggest a significant relationship exists between role stressors and absence. However, the direction of the relationship seems to be unclear based on the available evidence.

The last category of job stressors that has been related to absence is job context factors. In 1973, Ferguson conducted a comparative study of 516 telegraph operators with 155 mail-sorters. These data were also compared with an unspecified number of mechanics and clerks. The average number of episodes per absentee was significantly greater for telegraphers (4.0) than clerks and mechanics (2.6). The only occupational characteristic which differed between the groups was noise level in the work place.

Ivancevich (1974) assessed the effects of a 4-day, 40-hour work week by comparing an experimental group (n = 104) and a control group (n = 106) in a mid-sized manufacturing plant. The results indicate there were not significant differences in unexcused absences over the 13-month follow-up period.

In a study of boiler plant workers in high-noise job areas versus comparable workers in low-noise areas, Cohen (1976) found significantly higher absenteeism (as well as injuries and medical problems) among the employees exposed to excessive noise.

Watson (1981) studied absence behavior with 116 production employees in a small metal fabrication company. He found a significant bivariate correlation between shift and absence, but in a regression model with personal characteristics, job situation and satisfaction factors, shift did not make an independent contribution to absence.

Of the four available studies on job context factors, the evidence is mixed. The two investigations assessing noise both found significant correlations between job context and absence. The two studies that looked at working hours and shift found no relationship with absence.

In evaluating all of the studies reviewed, it seems that absence is an extremely complex variable, but one that warrants further investigation as a behavioral outcome of stressors, both at home and at work. Although most researchers have reported a significant inverse relationship between absence and task characteristics, role characteristics and job context factors, occasionally stressors have been associated with decreased rather than increased absence.

H_{5a}: Objective physical danger is positively related to absence through perceived physical danger (Figure 2, Arrows 1 and 3).

H_{5b}: Objective physical danger is positively related to absence (Figure 2, Arrow 2).

H_{5c}: Perceived physical danger is positively related to absence (Figure 2, Arrow 3).

Conditioning Variables: Social Support

Definition of Construct

The concept of social support will be used to represent conditioning or moderator variables. Although social support lacks a common definition in the literature, most authors agree that it is a multidimensional construct (Table 1). The definition chosen to guide this investigation is one proposed by House (1981). He defines social support as "a flow of emotional concern, instrumental aid, information, and/or appraisal between people" (p. 26). As shown in Table 1, the four aspects identified in House's definition are the most comprehensive of the group and each of the others can be categorized under them.

Of the four dimensions identified, emotional support, defined as providing empathy, caring, love and trust, appears to be the most important (House, 1981). It is used by each of the authors in Table 1 and empirical attempts to separate other forms of social support (such as

Table 1

Comparison of House's (1982) Social Support Dimensions with Selected Authors

Authors	Dimensions			
House (1981)	Emotional Support (liking, love, empathy)	Appraisal Support (information relative to self-evaluation)	Informational Support (about the environment)	Instrumental Support (goods and services)
G. Caplan (1974)	Emotional Mastery	Feedback	Problem-solving	
Pinneau (1975)	Emotional	Appraisal		Tangible
Cobb (1976; 1979)	Emotional	Esteem	Network	
R. Caplan (1979)	Psychological Objective Subjective			Tangible Objective Subjective
Kahn and Antonucci (1980)	Affect	Affirmation		Aid
Mueller (1980)	Emotional		Informational	Task-related
Cooper (1981)	Emotional		Cognitive	Behavioral
Thoits (1982)	Socio-emotional			Instrumental

instrumental) from emotional support have been largely unsuccessful (Abdel-Halim, 1982; Pinneau, 1975/1976; Wells, 1982). In addition, it is possible that other forms of support could have negative effects. Instrumental support, for instance, could produce over-dependence, or informational and appraisal support may actually increase the individual's perceptions of stress (House, 1981).

Social support is thought to reduce the impact of stressors on the individual in at least two ways. First, it can act directly, reducing the level of objective or perceived stressors and improving health (House, 1981). To illustrate this point, House discusses how a supportive environment has fewer objective conditions that create stress such as interpersonal conflict. Also, being surrounded by caring persons who are willing to listen can reduce strain by, for example, decreasing the individual's level of anxiety or need to engage in escapist drinking. This means, then, that social support may have beneficial effects regardless of the level of stress present.

Social support can also serve as a buffer or moderate against harmful effects of stressors by causing people to perceive the situation as less threatening. This hypothesis contends that social support is not a potent force in the absence of moderate or high levels of stress, but serves as a protection against the deleterious effects of stressors on perceived stress, strain and health outcomes. For example, high levels of co-worker support may not alter the danger involved in a particular job, but it may decrease the effects of perceived danger on psychological, physiological and behavioral strain.

Another issue involves sources of social support. House (1981) has identified three major sources of work-related support: supervisor support, co-worker support, and union support. Supervisor and co-worker support have a rich history, both theoretically and empirically, in the field of organizational behavior (Fiedler, 1967; Fleishman, Harris, & Burtt, 1955; French & Caplan, 1972; Likert, 1961, 1967; Stogdill, 1974). One or both of these have also been the focus of more recent studies specifically aimed at understanding the role of social support in relation to work stressors and strain. However, the potential role of unions as providers of support at work is relatively unexplored (House, Note 2).

House (1981) proposes that union stewards could substitute for or possibly complement supervisors as sources of social support because of their undivided loyalty to and concern for worker welfare. He also suggests that the union may provide a mechanism for promoting support among co-workers. There is some evidence that unions are beginning to see this as a viable role for themselves. In the period 1979-1981, two unions (Communications Workers of America and the Service Employees International) contracted with the Institute for Labor and Mental Health in Oakland, California, to provide intensive training programs for their shop stewards in dealing with the occupational stress of their members (Lerner & Schore, 1982). In these programs, stewards learn to work with employees, both at the individual and group level, to help them understand the relationship between work and strain, how to deal with strain, and how to break the cycle at work that is causing the strain. In the words of Schore:

> As unions reach out beyond the issues that we've already won, that are now taken for granted by most workers, there's the need to re-create that ability to be the buffer, for the union to be the buffer between the worker and society and to be seen and

> felt that way by its membership in order to reestablish the loyalty and activism that is absolutely essential in the labor movement. (Lerner & Schore, 1982, p. 132)

One purpose of the study is to focus on the buffering effects of supervisors, co-workers and union officials on the relationships between objective stressors and strain, and between perceived stressors and strain. In addition, direct effects of social support on strain will also be examined.

Social Support Literature

One of the earliest studies in this area was done by Cassel and Tyroler (1961) in the mountains of western North Carolina. In the early 1900's, a factory decided to locate in an isolated village of less than 100 people. Over the next 50-60 years, the company recruited and hired those from surrounding small mountain communities and by 1960, the labor force had increased to about 3,000 workers. The result was an ethnically homogeneous group living in the same town and doing the same work for similar pay. However, the researchers discovered that it was possible to identify two groups of workers based on how recently they had made the transition from rural agricultural to industrial living. One group, "first generation" factory workers, were those whose parents were farmers and who had been the first in the family to break tradition and leave an agricultural lifestyle for one in a factory town. "Second generation" employees were those whose parent(s) worked for the factory either previously or currently. Thus, first generation workers lacked cultural training for the expectations involved in industrial living, as well as being deprived of a close family support group that could understand the demands of factory life. The authors collected data from company records on a random stratified sample of 390 males ages 20-50 years. They found that second generation workers consistently reported fewer physical and mental symptoms than did first generation employees. In addition, absence levels (due to illness) in the second generation group declined markedly with length of service, but there was no change in absence for first generation workers with increased tenure. Consequently, even after controlling for age, second generation employees appear to have experienced better health than their first generation counterparts.

Cassel (1963) also reported a follow-up study conducted in the same plant with two groups of male employees doing similar jobs. After adjusting for age differences, the group with a constant set of co-workers had significantly lower serum cholesterol levels than did the group whose co-workers changed frequently. Thus, the opportunity for close continuous interaction with the same group of fellow workers appears to have been a major factor in reducing physiological strain.

In 1970, Matsumoto hypothesized that one of the reasons Japan has a lower death rate (67.8 per 100,000) due to coronary heart disease (CHD) than the United States (326.2 per 100,000) is that Japanese society has built meaningful social groups into their work situation from which the individual can derive emotional support. This hypothesis was explored by Marmot, Syme, Kagan, Kato, Cohen, and Belsky (1975) in their study of 11,900 men of Japanese ancestry aged 45-69 living in Japan, Hawaii and California. They found that the closer one lived to the mainland United States, the greater the age-adjusted prevalence of CHD. In other words, coronary heart disease, as diagnosed by electrocardiogram and self-reported symptoms of angina pectoris, increased from Japan to Hawaii and from Hawaii to the United States. In addition, these findings could not be explained by variations in the usual risk factors such as hypertension, smoking and serum cholesterol levels. Cassel (1976) describes how Marmot (1975) speculated that in the migration process, these men may have left behind important sources of social support, both at home and at work. Using an instrument he developed for measuring the extent to which traditional Japanese values had been retained, Marmot (1975) conducted a cross-sectional study on a sample of Japanese men living in California. He found that the prevalence of coronary heart disease was consistently higher in those men who had retained fewer traditional Japanese values.

In one of the few studies that conceptualize the union as a form of support, Weiner, Akabas, and Sommer (1973) report results from a mental health rehabilitation program carried out in the New York garment industry during 1964-1968. The design and implementation of the program was guided by the researchers, but equally involved management, union officials, friends, family and insurance carriers as referral agents. Over 700 employees were identified as having psychological problems; just under 500 received treatment. In evaluating the results of the case-finding/treatment program, the authors state that most patients, including those with neurotic and psychotic diagnoses, were able to continue working throughout the treatment period. In addition, there were no significant differences in the earnings (based on piece rate methods of payment) of those diagnosed as mentally ill who remained at work and the earnings of their matched peer group doing comparable work. Weiner et al. (1973), in their account of this project, give much of the credit for the success of the program to support from the Amalgamated Clothing Workers of America Union. They not only opened many doors facilitating the establishment of the program, but union stewards and officials referred 37 percent of the patients seen, in contrast to 11 percent referred by management. This would indicate that workers do see union representatives as sources of support based on their willingness to disclose problems to them.

French (1974) reported a study done with a group of scientists, engineers and administrators at Goddard Space Flight Center (n = 206) and Kennedy Space Center (n = 165). He and his colleagues found that in all three occupational groups, the effects of job stressors on strain were selectively altered by the presence of social support. Specifically, the negative effects of role ambiguity on serum cortisol was reduced by high social support from subordinates; the effect of work load on blood pressure was mitigated by supervisor and subordinate social support; the effect of work load on serum glucose was conditioned by co-worker and subordinate social support; the effect of work load on smoking was moderated by supervisor, co-worker and subordinate social support. Surprisingly, social support in any form did not affect the relationship between job stressors and psychological strain.

Some information is available on the characteristics of supportive persons at work in investigations by Burke and his colleagues. In 1975, Burke and Weir, using a sample consisting of three groups of male professionals, discovered that co-workers were seen as the primary sources of support at work. The most common reasons given for choosing a specific helper involved his or her skill in the areas of emotional support and personal validation. Burke, Weir and Duncan (1976) conducted a questionnaire study with 53 managers from a variety of organizations. Helpers at work were characterized as most often being either peers or supervisors of approximately the same age and sex as the respondent. However, Burke and Weir (1976) found a different type person being described when 70 lower and middle managers were asked to describe their most effective helper at work. These individuals tended to be subordinates who were younger than the respondent and of the opposite sex. Burke and Weir (1980) summarize this stream of research by stating that "transcending traditional boundaries may . . . allow for more effective helping to take place by legitimating a wider range of potential helpers" (p. 313).

Pinneau (1975/1976) used a stratified random subsample of 315 men from a larger study (see Caplan et al., Note 1) to test several hypotheses regarding buffering and main effects of social supports on perceived job stressors, psychological and physiological strains. His results show both supervisor and co-worker support to be negatively correlated with most of the perceived stressors such as role conflict and ambiguity, underutilization of skills, and work overload. Supervisor support exerted significant main effects on several psychological strains such as job dissatisfaction, boredom, depression and irritation. Social support from co-workers also correlated significantly with depression and anxiety. Only one main effect (in the predicted direction) of social support at work was observed on the physiological variables: supervisor support was correlated with reduced heart rate. However, using a subgrouping technique, support buffered or moderated no more relationships between perceived stressors and psychological or physiological strain than would be expected by chance. Thus, Pinneau (1975/1976) found substantial evidence for main effects of supervisor and co-worker support, especially on affective psychological states, but none for the buffering hypothesis.

Gavin and Axelrod (1977) assessed the stressor-strain relationship in a sample of 95 management-level employees in an underground mine. In addition, several potential moderators were tested for their effect on that relationship. They found medium to high correlations between a composite measure of anxiety, irritation and depression indicators and the following stressors: role conflict and ambiguity, job security, participation, variation in work load and underutilization of skills. Only two stressors, job security and underutilization of skills, were weakly related to psychosomatic symptoms. As with Pinneau (1975/1976), there were no significant moderating effects for supervisor or co-worker support.

Although no studies have specifically explored the moderating or buffering role of social support on the relationship between job stressors and emotional exhaustion, several exist that have looked at social support main effects. One of the earliest is a study by Maslach and Pines (1977) using questionnaire and interview data from 83 teachers, administrators and volunteers in several day care centers. They discovered that frequent staff meetings where employees could share experiences and provide support for each other were associated with lower levels of emotional exhaustion.

LaRocco and Jones (1978) tested whether supervisor and/or co-worker support moderated the relationship between a composite role conflict and ambiguity measure and physical symptoms. Their sample consisted of 3,725 U.S. Navy enlisted men. Their findings indicate there is no significant realtionship between role conflict/ambiguity and physical symptoms, and no buffering effect from either form of social support (tested by both moderated regression and subgrouping analyses).

Social workers (n = 129) served as the sample for investigating the effects of social support systems on tedium--a concept defined as a "general experience of physical, emotional, and attitudinal exhaustion" (Pines & Kafry, 1978, p. 604). Both supervisor and co-worker support were inversely correlated with tedium.

Absence behavior is discussed in Colligan and Murphy's (1979) review of seven industrial studies involving mass psychogenic illness--a concept defined as "the collective occurrence of physical symptoms and related beliefs among two or more persons in the absence of an identifiable pathogen" (p. 82). The complaints vary from setting to setting, but usually consist of headaches, nausea, sleepiness, chills, etc. In each instance, no biochemical or environmental cause could be isolated. However, several psychosocial stressors were identified in the review as being mentioned repeatedly by those affected. These include repetitive, boring work; pressure to increase production; excessive noise; poor lighting; variations in temperature; fumes; poor relations with supervisors; and lack of communication with co-workers (due to either noise or design of workplace). Colligan and Murphy (1979) conclude that the absence of social support, especially informational support, may be a major contribution to epidemics of psychogenic illness.

Caplan et al. (Note 1) did not look at moderating effects of social support, but did find supervisor and co-worker support to be inversely related to perceived stressors (responsibility for persons, role ambiguity and underutilization of skills), and to psychological strains (depression and anxiety). No consistent relationship with physiological strains such as heart rate, cholesterol and uric acid emerged.

House (Note 2) reported a study of 2,856 hourly workers at a large tire, rubber, plastics and chemicals manufacturing plant. Although most of the data were collected via questionnaire, independent assessments were made of objective job characteristics and biomedical data. All three categories of strain were examined. There was not a clear pattern, for either main or buffering effects, of supervisor and co-worker support on neurotic symptoms, physical symptoms, smoking, or drinking. Supervisor support does inversely correlate with three out of the four strains--neurotic symptoms, drinking and physical symptoms relating to ulcers, itch and rash, cough and phlegm. Buffering (tested using moderated regression) in the form of supervisor support was observed on the outcomes of drinking and physical symptoms (ulcers, cough and phlegm). Co-worker support moderated only the stressor-strain relationship between selected perceived stressors and ulcer, cough and phlegm symptoms. House (Note 2) explains this selective buffering based on the fact that excessive drinking, recurrent stomach pains associated with ulcers, and persistent coughing constitute manifest symptoms of strain, recognizable even at work. Thus, each of these would tend to elicit supportive behavior when exhibited, thereby reducing the importance of the stressor and possibly decreasing the strain experienced. Other, more subtle, strains may not be easily recognized on the job, and therefore do not activate the support process.

Kafry and Pines (1980) discuss results of three questionnaire studies that examined the relationship between emotional support from significant others and tedium, a concept closely related to emotional exhaustion. In six different samples, including social workers (n = 129), mental retardation workers (n = 198), professionals (n = 277, n = 205), and students (n = 294, n = 84), support was significantly negatively correlated with tedium.

LaRocco, House and French (1980) re-analyzed a stratified random subsample (n = 636) out of the Caplan et al. (Note 1) data to determine whether social support moderates the stress-strain relationship. Unlike Pinneau (1975/1976), who used subgrouping analysis to address this question, these authors used moderated regression analysis. Results show that support from supervisors and co-workers was negatively related to psychological strain and that co-worker support moderated eight out of ten relationships between various job stressors and depression and somatic complaints. In addition, supervisor support buffered four out of five relationships between stressors and irritation. The authors conclude by saying that the major difference between Pinneau's (1975/1976) work and their analysis is that he did not actually test for buffering in any of the stressor-strain relationships where there were no main effects.

Sawada, Ohtsuka, and Suzuki (1980) studied fatigue, a concept much like emotional exhaustion, in 32 male employees in a chemical factory. Daily records of behavior were obtained via questionnaire for one month. Results show that feelings of fatigue are significantly influenced by various factors, one of which is bad relations with co-workers. The authors point out, however, that fatigue may cause poor relations with peers rather than vice versa.

One hundred twenty-eight city bus drivers served as the sample for an investigation of person-environment fit job stressors and their effect on psychological and behavioral strain (Blau, 1981). A factor analysis of 18 job stress items yielded three stress factors: passenger/intracompany stress; scheduling assistance; and physical danger. Data on job dissatisfaction (psychological strain) and social support from supervisor and co-workers were collected by questionnaire. Performance data (behavioral strain) were obtained from company records. Physical danger was the only stressor that correlated significantly with performance, whereas passenger/intracompany stress and scheduling assistance were both related to job dissatisfaction. Supervisor and co-worker support exerted main effects on job dissatisfaction, but no buffering effects. Moderated regression and subgrouping were used in these analyses and similar results were obtained for both.

Abdel-Halim (1982) conducted a questionnaire study of 89 managers from a large heavy-equipment manufacturing firm. He found both supervisor and co-worker support to be negatively related to anxiety. Contrary to prediction, he also found a positive relationship existed between role conflict and anxiety for individuals with strong co-worker and supervisor support, while the relationship was negative for those with low co-worker and supervisor support. Abdel-Halim (1982) proposes that these unexpected findings may, in part, be due to apprehension about exposing one's weaknesses to significant others and, therefore, increase feelings of anxiety.

A sample consisting of 214 men and 115 women was used by Billings and Moos (1982) to investigate direct and buffering effects of a combined measure of supervisor and co-worker support. These individuals were employed in a variety of settings and data were collected by questionnaire. In the male sample, support exerted a direct negative effect on anxiety and buffered the relationships between work stressors and anxiety, and between work stressors and physical symptoms. No direct or moderating effects were found for women.

Karasek, Triantis, and Chaudhry (1982), using 1972 Quality of Employment data on 1,016 male workers, examined two types of social support from supervisors and co-workers. Decreases in psychological strain (depression) were associated with emotional and instrumental support from both supervisors and co-workers. Co-worker instrumental support was the only form that correlated significantly with behavioral strain (self-reported absence). Buffering effects were tested with a subgrouping technique. Results show a significant moderating effect on the relationship between job stressors and depression by supervisor emotional and instrumental support, and by co-worker emotional support. Co-worker instrumental support exhibited reverse buffering in that depression increased under high levels of peer support. No consistent buffering effects emerged for absence. The authors also found evidence to support a "stress-transfer" form of social support (p. 195). Individuals in low stress jobs reported higher levels of psychological strain where support (especially co-worker) was strong. According to the authors, this suggests that persons in low stress situations may absorb strain from those subjcted to high stress, thus equalizing some of the adverse effects of stress.

Parkes (1982) describes a natural experiment with 164 student nurses who were randomly assigned to different patient-care situations. Prior to ward assignments, social support (from supervisors and peers) did not correlate significantly with anxiety. However, at the end of the observation period, changes in social support correlated negatively with changes in anxiety levels. In other words, increases in social support were related to decreases in anxiety. No relationship was found between social support and absence due to illness.

Jackson (1983), in an experimental study described in the absence section of this report, found a composite measure of supervisor and co-worker support to be unrelated to absence at posttests done six and nine months after the pretest. However, support was inversely correlated with emotional strain at both posttests, indicating a consistent direct effect on psychological outcomes.

Gaines and Jermier (1983), in their investigation of 169 police officers and support personnel, found that supervisor and co-worker support did not exert independent contributions on emotional exhaustion when considered in a model with other predictors. However, co-worker support, in interaction with departmental context, was a significant correlate of emotional exhaustion. In other words, support significantly reduced exhaustion in the investigations bureau, but not in the patrol or service department. Thus, social support may differentially affect psychological strain, depending on job context.

Summary of Social Support Research by Type of Strain

Psychological Strain. In the six studies that specifically looked at anxiety as an outcome, five report direct negative effects from supervisor and/or co-worker support, and one did not test for main effects. Of these six, two report no significant buffering by support on the relationship between job stressors and anxiety. The remaining two that examined buffering found significant moderating effects, but one was significant only with males in the sample, and the other found the buffering effect to be reversed (high social support was associated with higher anxiety levels).

Turning to emotional exhaustion, the evidence shows a fairly clear pattern of main effects. All five studies have found co-worker support to be inversely correlated with emotional exhaustion. However, only two have investigated supervisor support and one found no significant relationship with exhaustion. The other study used a composite co-worker/supervisor measure, but did find an inverse relationship. No studies testing for buffering with regard to emotional exhaustion were located.

In summarizing the studies reviewed on various other psychological strains, the evidence is consistent with respect to direct effects. All five present negative correlations between supervisor support and strain, and four report inverse relationships between co-worker support and strain. As with anxiety, the support for buffering is mixed. Two studies found no significant moderating effects of either supervisor or co-worker support on the relationship between job stressors and strain. On the other hand, two report convincing evidence that both supervisor and co-worker support are important buffers between stressors and strain.

In conclusion, it appears that there is adequate evidence that supervisor and co-worker support decrease the levels of psychological strain. However, it is impossible to say, at this time, whether these two forms of support moderate either the relationship between objective stressors and psychological strain, or the relationship between perceived stressors and psychological strain. In addition, there are no studies available which have empirically tested whether social support from union officials has direct or buffering effects on strain.

Consequently, the social support hypotheses that follow will be stated according to the predictions in the theoretical model presented in Figures 1 and 2.

H_{6a}: Each social support is independently negatively related to anxiety (Figure 2, Arrow 4) when objective and/or perceived physical danger are in the model.

H_{6b}: Each social support buffers the relationship between objective danger and anxiety (Figure 2, Arrow 6).

H_{6c}: Each social support buffers the relationship between perceived danger and anxiety (Figure 2, Arrow 5).

H_{6d}: Each social support is independently negatively related to emotional exhaustion (Figure 2, Arrow 4) when objective and/or perceived physical danger are in the model.

H_{6e}: Each social support buffers the relationship between objective danger and emotional exhaustion (Figure 2, Arrow 6).

H_{6f}: Each social support buffers the relationship between perceived danger and emotional exhaustion (Figure 2, Arrow 5).

Physiological Strain. In two of the studies using physical symptoms, one reported a negative main effect for supervisor support on selected physical symptoms. The other investigation found no direct effect from a composite supervisor/co-worker support measure on physical symptoms. Out of the three studies testing for buffering, two found both supervisor and co-worker support to moderate the stressor-physiological strain relationship. The remaining study found no evidence for supervisor or co-worker buffering with respect to physical symptoms.

If objective measures of physiological strain are considered, the evidence is also mixed. The two studies looking at main effects show split results: co-worker support significantly decreased serum cholesterol in one, and both co-worker and supervisor support showed no correlation with heart rate, cholesterol or uric acid in the other. With regard to buffering, one author found several moderating effects of both supervisor and co-worker support on the relationship between stressors and objective physiological strains. However, the other study reported no buffering effects. As with psychological strain, the available research evidence is contradictory and, therefore, the following hypotheses are derived from the model in Figures 1 and 2.

H_{7a}: Each social support is independently negatively related to physical symptoms (Figure 2, Arrow 4) when objective and/or perceived physical danger are in the model.

H_{7b}: Each social support buffers the relationship between objective danger and physical symptoms (Figure 2, Arrow 6).

H_{7c}: Each social support buffers the relationship between perceived danger and physical symptoms (Figure 2, Arrow 5).

Behavioral Strain. Although no studies were located that examined supervisor or co-worker buffering on the stressor-absence relationship, several examined main effects of support. One study reported a direct negative effect of co-worker support on absence, and a review of seven studies identified poor supervisor and co-worker relations as precipitating factors in absence due to mass psychogenic illness. Two studies report no direct effects from a combination supervisor/co-worker support measure on absence.

The evidence is also mixed with regard to other forms of behavioral strain. Neither co-worker nor supervisor support exerted a main effect on job performance, nor buffered the relationship between stressors and performance in one study. Another investigation found supervisor support to be negatively correlated with excessive alcohol intake, and to moderate the relationship between objective stressors and drinking behavior. Thus, it appears that the empirical research on absence and on other forms of behavioral strain is inconsistent. Consequently, the hypotheses will be formulated congruent with the relationships in the stress model presented in Figures 1 and 2.

H_{8a}: Each social support is independently negatively related to absence (Figure 2, Arrow 4) when objective and/or perceived physical danger are in the model.

H_{8b}: Each social support buffers the relationship between objective danger and absence (Figure 2, Arrow 6).

H_{8c}: Each social support buffers the relationship between perceived danger and absence (Figure 2, Arrow 5).

In conclusion, this study will (1) further develop the concept of physical danger as a relatively unexplored task-related stressor and examine its relationship with strain in a non-glamorous occupation; (2) propose and test the potential of unions as a form of social support at work; and (3) empirically examine selected linkages in a theoretical model of stress, with special attention to the relationship between objective and subjective stressors and the controversial hypotheses regarding main effects of social support versus buffering effects.

CHAPTER III
METHOD

Context, Procedure and Sample

The study is based on data obtained from a sample of blue-collar workers employed by two departments within the University of Florida Physical Plant Division. The Physical Plant consists of eight separate departments and has approximately 600 employees, ranging from highly skilled engineers and management specialists to unskilled custodians and groundskeepers.

The two departments chosen for this study were maintenance and utilities. The maintenance department (n = 103) is composed primarily of skilled craftworkers in the areas of air conditioning, plumbing, construction, electrical, painting and roofing, who are responsible for repair work and small new construction projects within the university. In addition, there are three levels of management including foremen, and several unskilled trades helpers in the department.

The utilities department (n = 89) functions out of three separate geographical locations. There is a utilities distribution center which controls the outlay of electricity, chilled water, steam and sewage for the university. As with the maintenance department, these employees are mostly skilled craftworkers, such as electricians, plumbers, refrigeration mechanics and steamfitters, and they work the day shift only. The other two utilities subunits consist of a heat plant, which generates chilled water and steam, and a sewage treatment plant. These employees are, for the most part, highly trained technicians who operate complex equipment around the clock (three eight-hour shifts). Again, there are three levels of supervision, including foremen.

The entire physical plant is represented by a large public sector union known as AFSCME (American Federation of State, County and Municipal Employees). However, only about 20 percent of the physical plant work force actually belongs to the union (i.e., pays dues) in spite of the fact that the union bargains for all employees through the superintendent rank.

Approximately six weeks prior to collection of questionnaire data, meetings were held with representatives from the various management levels and with union officials. Both groups agreed to endorse the study. Interviews were then conducted with employees of all levels and across each department in order to learn more about what working in this particular organization means.

A letter was sent to each employee from the director of the Physical Plant one week before questionnaires were distributed explaining the purpose of the study (Appendix A). During the week of the actual survey, maintenance workers and utilities distribution center employees were called in from their field assignments to fill out questionnaires, and the researcher went to the heat plant and the sewage treatment plant for data collection during each of the three shifts. Groups ranging from 5 to 20 employees were given an explanation of the study by the researcher (Appendix B) and asked to fill in a questionnaire during normal working hours. Confidentiality of questionnaire data was assured and feedback was promised to each employee in the form of a letter summarizing the results of the study. Completion of the survey took approximately 40 minutes.

A total of 155 maintenance/utility employees returned questionnaires to the researcher. However, 11 were deleted from the analyses due to missing data. This left a total of 144 persons in the final sample; 85 in maintenance and 59 in utilities.

The respondents were 99.3 percent male. The age distribution was as follows: 18.7 percent were 30 years old or less; 27.8 percent were between 31 and 40 years old; 24.3 percent were between 41 and 50 years old; 22.9 percent were between 51 and 60 years old; and 6.3 percent were over 60 years of age. Job tenure in the sample ranged from less than two years (15.3 percent) to greater than 15 years (18.7 percent). Twenty-one percent had been in the same position for 10 to 15 years, 15.8 percent had been in the same position for 5 to 10 years, and 29.2 percent had been in the same job for 2 to 5 years.

Measures

Demographics

In the background section of the questionnaire, age, sex, job tenure, union membership, department membership and job classification were measured (Appendix C). Two of these, age and job tenure, were used as control variables when analyzing relationships in the stress model because they have been shown to influence reactions to stressors and shape people's social support networks (Moos & Mitchell, 1982). Sex was omitted as a control in this group because there was only one female in the sample. Union membership was collected in order that comparisons could be made in future analyses between union membership and social support from the union. Department and job were used for matching up supervisor ratings of danger with individual questionnaires.

Objective Stressor

Objective physical danger was rated by supervisors in each department who were considered experts on the nature of the task involved. In most cases, this was done by the person's immediate superior, but occasionally the rater was two levels above the individual.

The "physical hazards" dimension of the Position Analysis Questionnaire (McCormick, Jeanneret, & Mecham, 1972) was used as the rating instrument (Appendix D). The Position Analysis Questionnaire (PAQ) includes 194 different job elements that reduce to 32 job dimensions. Although the PAQ dimensions have not been used to predict job strain directly, Shaw and Riskind (1983) correlated information from the PAQ data bank, including physical hazards, with two existing data sets on strain and health outcomes. With one data set, they found physical hazards to be positively significantly related to heart disease, hypertension, ulcers, cirrhosis, suicides and falls. In the other, significant correlations were found between physical hazards and the number of dispensary visits. This archival study establishes a precedent, then, for an assessment of objective task characteristics, such as physical danger, with perceived stressors and job strain.

No reliability estimates have been reported for any of the dimensions of the PAQ in previous research. However, the alpha coefficient for this sample of supervisors was 0.89.

Perceived Stressor

Because perceived physical danger as a job stressor is a relatively unexplored area, no standardized measures of this concept are available. Consequently, danger was measured by a six-item scale (Appendix E) constructed by Jermier (Note 5). Three of the items were used in a previous study (Gaines & Jermier, 1983) with a sample of 169 police department employees. The alpha coefficient for that group was 0.95. The reliability estimate for this sample was 0.88.

Psychological Strain

State anxiety was measured with the 20-item State Anxiety Subscale (Appendix F) of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lusheme, 1970). It was adapted to measure job-related anxiety by including a statement in the instructions that requested respondents to describe their current feelings on the job.

This instrument has been used in over 1900 studies of anxiety and its reliability (ranging from alphas of 0.83 to 0.93) is well documented in Spielberger et al. (1970) and Spielberger (1972). The two most recent work stress studies to use state anxiety as an outcome also report high internal consistencies on the measure. Eden (1982), using a sample of first-year nursing students, obtained an alpha of 0.93. Ganster et al. (1982) reported an alpha of 0.92 for a sample of public agency employees. The reliability coefficient for this sample was also 0.92.

Emotional exhaustion was measured using the Emotional Exhaustion Subscale (Appendix G) of the Maslach Burnout Inventory (Maslach & Jackson, 1981). This scale has been used in a variety of public service organizations and its psychometric properties are reported by Maslach and Jackson (1981). The scale (MBI) was developed using interview and questionnaire data describing the attitudes and feelings of burned-out workers. Based on two separate administrations to 1,025 workers in different occupations, a four-factor solution was obtained with 25 items. Emotional exhaustion emerged as the central factor with nine items. Maslach and Jackson (1981) report an alpha of 0.74 for the subscale with a sample of 420 workers involved in various service occupations. Test-retest reliability was also measured for emotional exhaustion and found to be 0.82. More recently, Gaines and Jermier (1983) report an alpha of 0.90 for a sample of 169 police department employees. The reliability estimate for this sample of blue-collar workers was 0.86.

Physiological Strain

Physical symptoms have been measured in various ways by questionnaire, but there appears to be no option that is clearly preferable. In fact, two of the most current stress studies using physical symptoms as a strain developed their own measures. Ganster et al. (1982) administered a 17-item scale assessing a variety of physical complaints and obtained a reliabilty coefficient of 0.88, despite the diversity of the items. Zedeck et al. (1983) used a 49-item instrument and factor analyzed the responses. Three distinct subscales emerged: digestion problems; muscle pains; and heart problems. Each subscale had an alpha coefficient of greater than 0.79.

The measure of physical symptoms for this study is partially taken (15 items) from a scale used in the 1977 Quality of Employment Survey (Quinn & Staines, Note 6) developed by Belloc, Breslow, and Hochstim (1971). The remaining 16 items were written for this investigation in order to tap six major body systems (integument; head, ears, eyes, nose and throat; respiratory; cardiovascular; gastrointestinal; musculoskeletal) and one general health factor (Prior & Silberstein, 1973). The resulting 31-item scale (Appendix H) had an alpha of 0.89 in this sample.

Behavioral Strain

The measurement of absence is a much-debated topic. In examining three of the most common methods of measuring absence, it appears that they have somewhat different implications. The number of one-day absences an individual accumulates is thought to be indicative of voluntary absence as opposed to absence due to serious illness. Total number of days absent is known to be heavily influenced by long-term illness episodes and not reflective of a pattern of frequent short-term absences. Absence frequency, or the total number of times absent, reflects both a pattern of brief absences that occur often and absences of longer duration. Frequent short absences are relevant in stress research because they may be used as a coping mechanism by employees who are trying to stay healthy in spite of exposure to work stressors. However, longer periods of absence may also be the result of stressors, but ones that have worn down the individual and ended in illness.

In a study investigating the reliability of seven different absence measures, Chadwick-Jones, Brown, Nicholson and Sheppard (1971) found that absence frequency produced the highest inter-year correlation of any of the measures tested. They conclude by endorsing the use of absence frequency because a large portion of its variability is determined by short-term absences which are more frequent in organizational settings than are long-term absences. They also point out that: it is an unambiguous measure; standardization between studies would be possible; and its reliability estimate between years is superior to the other measures examined.

Other evidence that favors the use of absence frequency is that the two most current stress studies using absence as a strain employed frequency as their measure (Gupta & Beehr, 1979; Jackson, 1983). Thus, a self-report absence frequency measure was used in this investigation (Appendix I). Although archival records of absence would have been desirable, the question of anonymity was felt to be the more critical one. Many of the questions included on this questionnaire ask for somewhat personal information from respondents and their honest answers seemed more important than names.

Social Support

The social support scale chosen for this study is composed of four items used by Caplan et al. (Note 1) and one item written for this study (Appendix J). The Caplan et al. items (1, 2, 3, 5) are based on theoretical and empirical research by Gore (1973/1974), Likert (1961), Pinneau (Note 7), and Taylor and Bowers (1972). The cross-sectional estimates of reliability computed by Caplan et al. (Note 1) on an occupationally stratified random subsample of 318 ranks were: supervisor support = 0.83; co-worker support = 0.73. The fifth item (4) was added to insure that the concept of emotional support, as defined earlier, was adequately measured. However, comparisons can still be made between this study and previous research by using the original four items.

Other studies using the Caplan et al. (Note 1) items have reported similar reliabilities. Gavin and Axelrod (1977) obtained reliabilities that ranged from 0.66 to 0.87 with a sample of 95 management level employees. House (Note 2), in his study of 2,856 factory workers, obtained alphas of 0.88 for a six-item measure of supervisor support and 0.75 for a three-item measure of co-worker support. Both scales were adapted from Caplan et al. (Note 1). Blau (1981) also used Caplan et al. (Note 1) items and found internal consistency coefficients of 0.89 for supervisor support and 0.72 for co-worker support. The alpha coefficients for this sample were: supervisor support = 0.91; co-worker support = 0.88; and union support = 0.94.

Analyses

Means, standard deviations, reliabilities and bivariate correlation coefficients were computed for each variable in the study. A multivariate canonical correlation analysis was used to determine if the set of predictors chosen had a significant relationship to the set of dependent variables in the model.

A combination of bivariate correlations and multiple regression analyses were used to test for main effects. Hypothesis 1 (H_1) was tested by calculating a Pearson's correlation coefficient between perceived physical danger and objective physical danger. Hypotheses 2a-5a (H_{2a}-H_{5a}) were tested by regressing each strain variable (separately) on the control variables (age and job tenure), objective physical danger and perceived physical danger.

Hypotheses 2b-5b (H_{2b}-H_{5b}) were tested by correlating each strain with objective physical danger. Hypotheses 2c-5c (H_{2c}-H_{5c}) were tested by correlating each strain with perceived physical danger. Hypotheses 6a-8a (H_{6a}-H_{8a}) and hypothesis 6d (H_{6d}) were tested by regressing each strain, separately, on the control variables, objective physical danger and the three social support variables, and then on the control variables, objective and perceived physical danger and the support variables. In these stepwise, hierarchical analyses, the independent effects of each predictor were observed by forcing in the control variables first, then allowing the stressor(s) to enter, and (where appropriate) allowing the social support variables to enter last.

Moderated regression analyses were used to test for the buffering or moderating effects of social support on the objective danger-strain relationships and on the perceived danger-strain relationships. Hypotheses 6b-8b (H_{6b}-H_{8b}) and hypothesis 6e (H_{6e}) were tested by regressing each strain (y), separately, on the control variables (C_1, C_2), objective physical danger (OPD), supervisor, co-worker and union support (SS, CS, US) and interaction terms consisting of each support variable multiplied by objective danger (SS · OPD, CS · OPD, US · OPD). This effect was estimated by the following equation:

$$\hat{y} = a + b_1c_1 + b_2c_2 + b_3\mathrm{OPD} + b_4\mathrm{SS} + b_5\mathrm{CS} + b_6\mathrm{US}$$

$$+ b_7\mathrm{SSOPD} + b_8\mathrm{CSOPD} + b_9\mathrm{USOPD} + e.$$

Buffering was considered to have occurred if b_7, b_8, or b_9 is significant over and above the additive effects in the equation (b_1-b_6). Hypotheses 6c-8c (H_{6c}-H_{8c}) and hypothesis 6f (H_{6f}) were tested in the same manner by regressing each strain on the control variables, objective physical danger, perceived physical danger, supervisor, co-worker and union support, and interaction terms between each support variable and perceived danger.

CHAPTER IV
RESULTS

Descriptive Statistics

Means, standard deviations and reliability cofficients are presented in Table 2. Each scale demonstrated acceptable internal consistency and comparative statistics are reported in the Method section.

Conditioning Variables

The average levels of social support varied among sources, with co-worker support being highest at 17.84, and union support being lowest at 11.86. Of the three, however, union support demonstrated the most variance, SD = 6.34, as compared with 4.56 (co-worker) and 5.40 (supervisor).

Dependent Variables

Psychological Strain. Because emotional exhaustion has not been used with blue-collar workers in previous research, no normative data are available for samples such as this one. However, in comparison with a sample of 420 human service workers (Maslach & Jackson, 1981), the mean score on emotional exhaustion for this sample (15.9, SD = 10.87) is significantly lower ($p < 0.01$). The other available study using the Emotional Exhaustion Subscale (Gaines & Jermier, 1983) reported a mean of 18.4 (SD = 12.1), which is not significantly different from the mean for this sample.

Table 2

Means, Standard Deviations and Reliabilities

(n = 144)

	Variable	Number of items	Mean	Standard deviation	α
1.	Age	1	5.87	2.32	--
2.	Job tenure	1	5.40	2.17	--
3.	Objective danger	4	7.58	3.92	0.87
4.	Perceived danger	6	17.31	5.73	0.88
5.	Supervisor support	5	16.03	5.40	0.91
6.	Co-worker support	5	17.84	4.56	0.88
7.	Union support	5	11.86	6.39	0.94
8.	Emotional exhaustion	9	15.90	10.87	0.86
9.	State anxiety	20	39.01	11.17	0.92
10.	Physical symptoms	31	54.17	13.94	0.89
11.	Absence frequency	1	1.67	1.75	--

Note: Reliabilities calculated using Cronbach's alpha formula.

The average level of state anxiety in this sample was 39.01 (SD = 11.17). This is slightly higher than a baseline mean of 36.8 reported by Eden (1982) with a group of 39 nursing students. However, statistical comparison is not possible because standard deviations were not reported. A second study using state anxiety as a stressor (Ganster et al., 1982) reported means of 46.2 and 44.6 for two groups of public agency employees prior to implementation of a field experiment. These scores are significantly higher ($p < 0.01$) than the mean obtained for this sample.

Physiological Strain. The mean for physical symptoms was 54.17 (SD = 13.94). This is significantly higher ($p < 0.01$) than the average score obtained using the same scale with a sample of 99 nurses (McIntosh, Note 8). No other comparative data are available as this version of the scale has not been used previously in research.

Behavioral Strain. The mean for absence frequency was 1.67 (SD = 1.75). This indicates that the average respondent was absent approximately two different periods of time during the three months just prior to the survey. Nearly 27 percent of the group had not been absent at all and 5.6 percent had been absent at least seven different times during the previous three months. The mean levels of absence in this sample were significantly higher ($p < 0.01$) than those in McIntosh's (Note 8) sample of nurses.

Correlations

Predictors

Bivariate correlations between variables are shown in Table 3. As predicted by the stress model used to guide this study, the two

Table 3

Intercorrelations

(n = 144)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Age	--										
2. Years in position	0.46	--									
3. Objective danger	-0.17	0.04	--								
4. Perceived danger	-0.29	-0.08	0.32	--							
5. Supervisor support	0.36	0.21	0.06	-0.29	--						
6. Co-worker support	0.17	0.25	-0.05	-0.10	0.39	--					
7. Union support	-0.04	0.06	0.12	0.03	0.06	0.20	--				
8. Emotional exhaustion	-0.25	-0.02	0.10	0.28	-0.41	-0.24	-0.01	--			
9. State anxiety	-0.20	-0.05	0.12	0.27	-0.46	-0.28	0.03	0.60	--		
10. Physical symptoms	-0.11	0.00	0.04	0.21	-0.23	-0.13	-0.09	0.47	0.47	--	
11. Absence frequency	-0.15	0.07	0.20	0.27	-0.12	-0.26	0.09	0.26	0.20	0.16	--

Note: $r_{xy} > 0.16$, $p < 0.05$; $r_{xy} > 0.21$, $p < 0.01$.

independent variables, objective physical danger and perceived physical danger, are significantly correlated ($r_{xy} = 0.32$, $p < 0.01$).

Conditioning Variables

Two of the three social support correlations were significant: co-worker and supervisor support were positively related ($r_{xy} = 0.39$, $p < 0.01$), as were co-worker and union support ($r_{xy} = 0.20$, $p < 0.05$). Supervisor and union support were unrelated.

Dependent Variables

The four strain variables all show significant positive bivariate correlations among each other. The highest correlation coefficient between any two variables in the study was the one between emotional exhaustion and state anxiety ($r_{xy} = 0.60$, $p < 0.01$). However, the magnitude of this relationship is not unexpected since both variables are designed to measure psychological strain. In fact, the stress model suggests that correlations among each of the strains would be anticipated because they are all hypothesized outcomes resulting from similar stimuli (i.e., stressors).

Factor Analysis of Social Support Scales

Because of the centrality of the social support variables to the study, a principal components factor analysis of the three scales--supervisor, co-worker and union support--was performed (Table 4). The varimax rotated analysis produced a three-factor solution with eigenvalues ranging from 4.96 (union support) to 1.74 (co-worker support). The factor loadings were congruent with a priori assignment of items to the three scales and ranged betweem 0.71 and 0.97.

Table 4

Varimax Rotated Factor Analysis of Social Support Variables

(n = 144)

	Factors:	1	2	3
	Eigenvalues:	4.96	3.52	1.74
1	Supervisor Support	-0.01	0.78	0.11
2		-0.01	0.75	0.17
3		-0.02	0.82	0.25
4		0.11	0.80	0.17
5		0.03	0.83	0.13
6	Co-worker Support	0.07	0.10	0.71
7		0.08	0.04	0.75
8		0.03	0.27	0.84
9		0.18	0.22	0.73
10		0.10	0.25	0.68
11	Union Support	0.85	0.05	0.11
12		0.85	-0.09	0.06
13		0.97	0.01	0.07
14		0.85	0.05	0.10
15		0.82	0.07	0.12

Multivariate Regression Analysis

A multivariate canonical correlation analysis between the predictor set (age, job tenure, objective and perceived danger, and supervisor, co-worker and union support) and the dependent variables (emotional exhaustion, state anxiety, physical symptoms and absence frequency) was performed. Only one canonical variate was extracted from this analysis. The overall multivariate test of significance produced a Pillais Trace value of 0.482 ($F = 31.4$, $p < 0.001$). Based on this result, each dependent variable was then examined separately for correlates or moderators at the 0.05 or less significance level.

Correlational and Multiple Regression Analyses

Hypothesis 1

When perceived danger was correlated with objective danger (Table 3), the Pearson bivariate correlation coefficient was 0.32 ($p < 0.01$). This finding supports Hypothesis 1 (objective danger is positively related to perceived danger).

Hypotheses 2-5

As shown in Table 3, objective danger was not related to emotional exhaustion, state anxiety, or physical symptoms, but was positively related to absence frequency ($r_{xy} = 0.20$, $p < 0.05$). These findings support Hypothesis 5b (objective danger is positively related to absence frequency) but do not support Hypotheses 2b-4b (objective danger is positively related to state anxiety, emotional exhaustion and physical symptoms).

The bivariate correlations in Table 3 also show that perceived danger was positively related to anxiety ($r_{xy} = 0.27$, $p < 0.01$), to emotional exhaustion ($r_{xy} = 0.28$, $p < 0.01$), to physical symptoms ($r_{xy} = 0.21$, $p < 0.05$) and to absence ($r_{xy} = 0.27$, $p < 0.01$). These results support Hypotheses 2c-5c (perceived danger is positively related to strain).

When the strain outcomes were regressed on the control variables (age and job tenure) and on objective and perceived danger in the same model (Table 5), perceived danger was positively related to state anxiety ($F = 6.32$, $p < 0.05$), to emotional exhaustion ($F = 6.47$, $p < 0.05$), to physical symptoms ($F = 4.94$, $p < 0.05$) and to absence frequency ($F = 5.73$, $p < 0.05$). Objective danger was unrelated to any of the strain variables with perceived danger in the model, and age was a significant negative predictor of emotional exhaustion ($F = 6.14$, $p < 0.05$). As discussed previously, objective danger was positively related to perceived danger but related only to one strain (absence). The bivariate correlations, when considered with the regression results, indicate that there is support for Hypotheses 2a-5a (objective danger is positively related to strain through perceived danger).

Hypotheses 6a-8a, 6d

As shown in Table 6, there was a consistent pattern of significant negative relationships between the social support variables and the strain outcomes. In the model with objective danger as the stressor, supervisor support was inversely related to emotional exhaustion ($F = 15.07$, $p < 0.01$), to anxiety ($F = 23.41$, $p < 0.01$) and to physical symptoms ($F = 4.7$, $p < 0.05$). In the model with both objective and perceived danger, supervisor support was negatively correlated with

Table 5

Strain Outcomes Regressed on Danger and Control Variables

(n = 144)

Predictors	Emotional exhaustion		State anxiety		Physical Symptoms		Absence Frequency	
	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio
$(H_{2a}-H_{5a})$								
Age	-0.23*	6.14	-0.15	2.38	-0.09	0.88	-0.14	2.31
Job tenure	0.10	1.28	0.03	0.14	0.06	0.45	0.15	2.60
Objective danger	-0.02	0.04	0.02	0.08	-0.04	0.22	0.10	1.37
Perceived danger	0.22*	6.47	0.22*	6.32	0.20*	4.94	0.21*	5.73
R^2	0.12		0.09		0.05		0.11	

*$p < 0.05$.

Table 6

Strain Outcomes Regressed on Danger, Social Support and Control Variables

(n = 144)

Predictors	Emotional exhaustion		State anxiety		Physical Symptoms		Absence Frequency	
	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio
(H_{6a}-H_{8a}, H_{6d})								
Objective Danger Model								
Age	-0.16	3.04	-0.04	0.24	-0.07	0.52	-0.17	3.08
Job tenure	0.15	2.79	0.08	0.91	0.09	0.97	0.21*	5.24
Objective danger	0.08	0.96	0.12	2.37	0.04	0.27	0.13	2.60
Supervisor support	-0.34**	15.07	-0.41**	23.41	-0.21*	4.70	-0.01	0.01
Co-worker support	-0.11	1.77	-0.14	2.77	-0.09	1.03	-0.30**	11.59
Union support	0.01	0.01	0.06	0.71	-0.04	0.21	0.12	2.21
R^2	0.21		0.25		0.07		0.16	

Table 6.--Continued

Predictors	Emotional exhaustion		State anxiety		Physical Symptoms		Absence Frequency	
	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio
Perceived Danger Model								
Age	-0.14	2.27	-0.03	0.08	-0.05	0.23	-0.14	2.01
Job tenure	0.14	2.66	0.08	0.84	0.09	0.89	0.20*	5.09
Objective danger	0.04	0.19	0.08	1.08	0.00	0.00	0.07	0.64
Perceived danger	0.13	2.43	0.11	1.82	0.15	2.68	0.21*	5.68
Supervisor support	-0.30**	11.24	-0.38**	18.71	-0.16	2.79	0.05	0.31
Co-worker support	-0.12	1.98	-0.14	3.00	-0.05	0.29	-0.31**	12.75
Union support	0.01	0.02	0.07	0.75	-0.08	0.99	0.12	2.39
R^2	0.22		0.26		0.09		0.19	

*p < 0.05.

**p < 0.01.

emotional exhaustion ($F = 11.24$, $p < 0.01$) and with anxiety ($F = 18.71$, $p < 0.01$).

Co-worker support was inversely related to absence frequency in both models. When only objective danger was considered, co-worker support was correlated with absence (inversely; $F = 11.59$, $p < 0.01$), as was age (positively; $F = 5.24$, $p < 0.05$). In the perceived danger model, co-worker support was correlated with absence (inversely; $F = 12.75$, $p < 0.01$), as were age (positively; $F = 5.09$, $p < 0.05$) and perceived danger (positively; $F = 5.68$, $p < 0.05$).

No independent effects were observed by union support on any of the four strains. In addition, there were no significant predictors of physical symptoms in the perceived danger model. These results lend partial support to Hypotheses 6a-8a and 6d (each social support is independently negatively related to strain when objective and/or perceived danger are in the model).

Moderated Regression Analyses

Hypotheses 6b-8b, 6e

Table 7 presents the results of interactions between the social support variables and objective danger. Although the entire model is presented, main effects will not be addressed as they have already been reviewed in the previous section.

Two interaction terms significantly correlate with absence: co-worker support x objective danger (inversely; $F = 6.04$; $p < 0.05$) and union support x objective danger (positively; $F = 5.03$, $p < 0.05$). In the first case, the negative beta coefficient indicates that co-worker support reduces or buffers the relationship between objective danger (stressor) and absence behavior (strain). In the second interaction,

Table 7

Strain Outcomes Regressed on Objective Danger, Social Support and Controls: Interaction Effects

(n = 144)

Predictors	Emotional exhaustion		State anxiety		Physical Symptoms		Absence Frequency	
	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio
(H_{6b}-H_{8b}, H_{6e})								
Age	-0.17	3.37	-0.06	0.48	-0.08	0.59	-0.18	3.47
Job tenure	0.15	2.69	0.06	0.55	0.11	1.24	0.20*	4.76
Objective danger	-0.42	1.26	-0.43	1.40	-0.45	1.27	0.71	3.60
Supervisor support	-0.37	3.54	-0.62**	10.83	-0.08	0.15	0.02	0.01
Co-worker support	-0.29	2.04	-0.13	0.46	-0.36	2.76	0.14	0.48
Union support	-0.10	0.30	-0.15	0.73	-0.16	0.69	-0.25	1.78
Supervisor support x objec. danger	0.08	0.06	0.43	1.71	-0.21	0.32	-0.07	0.05
Co-worker support x objec. danger	0.38	0.93	0.00	0.00	0.68	2.56	-0.97*	6.04
Union support x objec. danger	0.16	0.40	0.33	1.80	0.10	0.15	0.57*	5.03
R^2	0.22		0.27		0.10		0.21	

*$p < 0.05$.

**$p < 0.01$.

the positive beta coefficient suggests that union support moderates or buffers the relationship between objective danger and absence, but not in the expected direction. In other words, under conditions of high union support, objective danger increases absence rather than decreasing it. The two interaction terms accounted for an increase of 0.02 in R^2 for absence.

Due to the difficulty of interpreting two significant interaction terms in the same model, additional regression analyses were done with all of the main effects included, but with each interaction term added separately. When this was done, co-worker support x objective danger dropped to insignificance ($F = 3.5$, $p > 0.05$), as did union support x objective danger ($F = 1.87$, $p > 0.05$).

Supervisor support did not exert buffering effects in combination with objective danger. Also, no buffering effects were observed for the other strains--emotional exhaustion, state anxiety or physical symptoms. In addition, the two significant interactions in the full model dropped out when examined separately. Consequently, there is no support for Hypotheses 6b-8b and 6e (each social support buffers the relationship between objective danger and strain).

Hypotheses 6c-8c, 6f

Table 8 presents the results of interactions between social support and perceived danger. The interaction between supervisor support and perceived danger significantly correlated with emotional exhaustion (inversely; $F = 4.12$, $p < 0.05$). This means that supervisor support moderates the effect of perceived danger on emotional exhaustion. The variance explained in exhaustion increased by 0.05 when the interaction term entered the model.

Table 8

Strain Outcomes Regressed on Perceived Danger, Social Support and Controls: Interaction Effects

(n = 144)

	Emotional exhaustion		State anxiety		Physical Symptoms		Absence Frequency	
Predictors	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio	Beta weight	F-ratio
(H_{6c}-H_{8c}, H_{6f})								
Age	-0.13	1.84	0.01	0.01	-0.03	0.12	-0.13	1.97
Job tenure	0.15	2.97	0.08	0.84	0.08	0.78	0.22*	6.17
Objective danger	-0.00	0.00	0.06	0.64	-0.01	0.01	0.06	0.46
Perceived danger	-0.05	0.02	-0.82**	7.80	-0.30	0.79	0.48	2.35
Supervisor support	0.31	1.01	-0.39	1.75	-0.28	0.71	0.38	1.49
Co-worker support	-0.67*	4.81	-0.76*	6.72	-0.30	0.77	-0.20	0.39
Union support	-0.21	0.78	-0.16	0.49	-0.08	0.10	-0.33	1.85
Supervisor support x perc. danger	-0.68*	4.12	0.07	0.05	0.17	0.21	-0.40	1.42
Co-worker support x perc. danger	0.77	3.08	0.96*	5.22	0.40	0.71	-0.25	0.31
Union support x perc. danger	0.28	1.03	0.27	1.03	-0.01	0.01	0.56*	4.01
R^2	0.26		0.32		0.10		0.22	

*$p < 0.05$.

**$p < 0.01$.

One interaction, co-worker support x perceived danger was significantly related to state anxiety (positively; $F = 5.22$, $p < 0.05$). Again, this indicates a buffering effect by co-worker support on the relationship between perceived danger and anxiety, but in the reverse direction. Perceptions of danger would increase feelings of anxiety under conditions of high co-worker support. The interaction term increased the R^2 from 0.25 to 0.32.

The interaction between union support and perceived danger significantly correlated with absence (positively; $F = 4.01$, $p < 0.05$). As with the interaction between union support and objective danger, the buffering effect implies that perceived danger leads to increased absence when union support is high. The amount of variance explained increased from 0.16 to 0.22 with the inclusion of the interaction term.

Because two of the three significant interaction terms were in the opposite direction than predicted, additional regression analyses were done which included all of the main effects but only the significant interaction term. When emotional exhaustion was regressed on the predictor set and supervisor support x perceived danger, the interaction term was not significant ($F = 0.96$, $p > 0.05$). When absence was regressed on the predictor set and union support x perceived danger, the interaction term again became insignificant ($F = 2.3$, $p > 0.05$). Only the co-worker support x perceived danger interaction significantly correlated with anxiety (positively; $F = 10.41$, $p > 0.01$) when the reduced models were examined.

In summary, each of the three social support variables showed significant moderating effects in interaction with perceived danger in the full model. Of the four strain outcomes, physical symptoms was the only variable that was not affected by buffering. However, in the reduced models, only one interaction was significant and it was in the reverse direction. It appears, then, that there is no support for Hypotheses 6c-8c and 6f (each social support buffers the relationship between perceived danger and strain).

CHAPTER V
DISCUSSION

This study empirically evaluated the relationships among objective stressors, perceived stressors, strain and moderator variables as specified in a theoretical model of stress adapted from Caplan et al. (Note 1) and House (1974, 1981). The results obtained from a sample of blue-collar workers in a state agency indicate support for linkages between objective stressors and perceived stressors, between perceived stressors and strain, and between moderator variables and strain. There was no support for buffering effects by conditioning variables on the objective stressor-strain relationships and on the perceived stressor-strain relationships.

Research Questions

Is There a Relationship between Objective Physical Danger at Work and Perceived Physical Danger?

Contrary to what previous research would suggest, objective danger in this sample was moderately correlated with perceived danger. Although there is no prior empirical evidence on danger as objective and perceived stressors, there are several studies that have found very weak correlations between other objective and perceived stressors (Coburn, 1975; Eden, 1982; House, Note 2; Kahn et al., 1964; Kasl, 1973; Wells, 1982). Only French and Caplan (1972), Sales (1970) and Karasek (1979) have obtained fairly strong correlations between subjective and objective stressors.

This is an especially important finding, not only because of the mixed results reported above, but also because of the urgent call by stress theorists and researchers to explore the extent to which perceptions of the environment agree with objective data (Beehr & Newman, 1978; House, Note 2; Kasl, 1978). The positive relationship between objective and perceived danger in this sample suggests at least two possibilities. The more general inference is that employees do hold somewhat accurate perceptions about the objective context in which they work. A more specific conclusion is that exposure to physical danger at work and employees' perception of that danger coincide. This is in contrast to studies with other occupations that have suggested danger may be under- or over-estimated in order to socially construct an acceptable image (Jermier, 1982; Mayer & Rosenblatt, 1975). It may be that blue-collar craftsmen, such as the ones in this sample, have less need to distort the amount of danger encountered than occupations such as police, who are expected by society to risk their lives on a daily basis and, therefore, must live up to those expectations by creating an aura of danger over and above what actually exists.

What are the Effects of Objective Physical Danger on Strain Outcomes?

In spite of the positive relationship predicted by the stress model, objective danger related significantly only to absence. This is not entirely unexpected, since previous research has produced conflicting results.

Psychological Strain. Caplan and Jones (1975), Eden (1982) and Sales (1970) found objective stressors to be significantly related to anxiety, but, like this study, Ganster et al. (1982) and Shaw and

Riskind (1983) found them to be unrelated. No studies are available that have assessed the relationship between objective stressors and emotional exhaustion.

Physiological Strain. The evidence is mixed with regard to physical symptoms. Gardell (1976) and Jacobsen (1972) found significant correlations between objective stressors and physical symptoms. On the other hand, Coburn (1975) and Ganster et al. (1982) found no significant correlations between the two, which supports the present findings.

Behavioral Strain. The studies that have examined objective stressors and absence show more consistent results. Cohen (1976), Ferguson (1973), Gardell (1976) and Hedges (1973) report significant correlations between objective stressors and absence behavior, whereas Ivancevich (1974) found no such correlations. The results from this study support the majority of these findings.

Summary. The contradictory nature of previous research and the consistent pattern of nonsignificant correlations for three of the four strains in this study suggests that the relationship between strain and objective stressors in general, and physical danger more specifically, is a fragile one. Rather than exerting a direct effect on strain outcomes, objective danger may affect strain through other variables such as one's perception of danger.

What are the Effects of Perceived Physical Danger on Strain?

As predicted by the stress model, perceptions of danger are positively related to each strain outcome. The majority of studies reviewed support this finding.

Psychological Strain. With regard to anxiety, Beehr et al. (1976), Parasuraman (Note 3) and Sales (1970) report positive correlations between perceived stressors and anxiety. Only Caplan et al. (Note 1) found them to be unrelated. Gaines and Jermier (1983) discuss a positive correlation between perceived physical danger in interaction with departmental context and emotional exhaustion. However, Kafry and Pines (1980) did not find such a relationship.

Although both psychological strains were related to perceived danger in this study, there appears to be no real difference between the effects of physical danger on transitory, short-term psychological strain (anxiety) and on a more cumulative, long-term variety (emotional exhaustion). However, emotional exhaustion may exert a more powerful effect on health outcomes, which were not included in this investigation (Pelletier, 1977). In addition, it seems safe to conclude that emotional exhaustion is a strain that is applicable to any occupation exposed to physical danger, even those outside of the human services classification.

Physiological Strain. Each of the studies assessing the relationship between perceived stressors and physical symptoms indicate positive correlations (Caplan et al., Note 1; Coburn, 1975; Margolis et al., 1974; Zedeck et al., 1983). These findings, combined with the results from this study, suggest that the growing concern over stressors at work and resulting health problems in this society is a legitimate one. In fact, this relationship may be a major factor in skyrocketing health care costs that are one of the most perplexing and salient social problems of the decade.

Behavioral Strain. Most of the absence studies found positive correlations between perceived stressors and absence behavior (Baumgartel & Sobel, 1959; Bragg & Andrews, 1973; Cooper, 1973; Gupta & Beehr, 1979; Hackman & Lawler, 1971; Hackman & Oldham, 1976; Johns, 1978; Karasek, 1979; Margolis et al., 1974; Mowday & Spencer, 1981; Nicholson et al., 1977; Spencer & Steers, 1980; Turner & Lawrence, 1965), and thus support the present findings. However, two investigations report negative correlations between perceived stressors and absence (Jackson, 1983; Johns, 1978).

Although it is difficult to make a generalization based on the existing evidence, this study and the majority of those reviewed indicate that absence is a response to stressors at work, rather than a preventative measure used to decrease experienced strain. However, it is very possible that different organizations and/or occupations see absence in varying ways. Only additional studies, preferably using similar absence measures, will answer this question.

Summary. It appears, then, that employees' perceptions of physical danger, or of other stressors associated with the job, profoundly affect the amount of psychological, physiological and behavioral strain that they experience. These findings seem especially supportive of Lazarus' (1966) statement that stress is a universally distressing human experience that heavily influences our psyches, our health, and our behavior.

Does Objective Danger Only Affect Strain Through Perceived Danger, or Does It Exert an Independent Effect?

When both objective and perceived danger are in the model, only perceived danger correlates significantly with strain outcomes. This finding, combined with the fact that objective danger is correlated with perceived danger, suggests that the effect of objective danger on strain is an indirect one through perceived danger. Although several studies have examined objective and perceived stressors (Coburn, 1975; Eden, 1982; French & Caplan, 1972; House, Note 2; Kahn et al., 1964; Karasek, 1979; Kasl, 1973; Sales, 1970; Wells, 1982), none of them have looked at objective and perceptual measures of the same stressor and attempted to determine if one or both are significant predictors of strain with both variables in the model.

The current evidence indicates that, although objective and perceived stressors are related, perceptual stressors are the dominant force creating strain for individuals.

Do the Three Social Supports Affect Strain Outcomes Differentially?

There is a consistent pattern of results for the social support variables in both the objective stressor model and the perceived stressor model. Supervisor support is negatively related to emotional exhaustion and anxiety in both models and to physical symptoms in the objective danger model. Co-worker support is inversely correlated with absence in both models and union support did not correlate significantly with any of the strains.

Psychological Strain. In reviewing the social support literature, 12 studies report a main effect for supervisor support on psychological strain--including but not limited to emotional exhaustion and anxiety (Abdel-Halim, 1982; Billings & Moos, 1982; Blau, 1981; Caplan et al., Note 1; House, Note 2; Jackson, 1983; Kafry & Pines, 1980; Karasek et al., 1982; LaRocco et al., 1980; Maslach & Pines, 1977; Pines & Kafry, 1978; Pinneau, 1975/1976). Thus, previous research, along with the current findings, indicates that supervisors are important sources of social support at work and that they have a potent impact on psychological strain experienced by employees.

Physiological Strain. The effect of supervisor support on physical symptoms is less dramatic--both in the literature and in this sample. Pinneau (1975/1976) found supervisor support to be related to a decrease in heart rate among employees. House (Note 2) reports supervisor support to be negatively related to a variety of physical symptoms such as ulcers, rash, cough and phlegm. Looking at previous results, and at the fact that supervisor support is related to physical symptoms in only one model, and at the low correlation between support and physical symptoms, it appears that physiological strain may be more impervious to the potential positive effects of social support than is psychological strain. The other possibility is that social support affects physical symptoms indirectly through psychological strain. In other words, supervisor support may lower anxiety levels which, in turn, may decrease certain physical symptoms such as stomach pain or insomnia.

Behavioral Strain. Co-worker support is a significant negative correlate in both models of one strain--absence frequency. This finding is in direct contrast to the social support studies reviewed previously. Only one investigation (House, Note 2) found a main effect for any behavioral strain and it was a negative correlation between supervisor support and escapist drinking. No main effects have been reported between co-worker support and absence.

Despite a lack of previous research to substantiate this finding, it is a very intuitive one. If cohesiveness or mutual support in a work group is high, it seems plausible that the members will be more motivated to attend work and enjoy the benefits of peer interaction. Also, if there is a sense of camaraderie in the group, members may be more hesitant to miss work capriciously, thereby potentially increasing the workload for their friends.

Control Variables. In addition to the relationship between absence and co-worker support, job tenure emerges for the first time as a predictor of absence in both models. The longer a person in this sample had been in a job, the more often that person was absent. One possible explanation for such an effect is that job tenure may be a surrogate measure for lack of promotions and/or for negative job evaluations. Therefore, if employees feel that they are in a dead-end job with no possibility of advancement, absence may become a way of expressing discontent with work.

Main Effects Versus Buffering. The pattern of social support results in this study brings up an additional issue. This involves the change in perceived danger from a significant predictor of psychological and physiological strain in the previous models to insignificance when social support is added. Although these findings have been discussed here as main effects, there is a precedent in the literature (Billings & Moos, 1982) for labeling the drop in beta coefficients of the stressors from significant to insignificant with the inclusion of social support as "buffering." Billings and Moos (1982) explain that buffering has taken place if the effect of work stress is reduced when social support, or other potential moderators, are included in the regression model. However, this investigation will continue to interpret results using the more widely accepted definition of buffering stated in the Method section.

Summary. In sum, supervisor and co-worker support do affect strain outcomes differentially. Supervisor support seems to impact psychological strain (anxiety and emotional exhaustion), whereas co-worker support has its effect on behavioral strain (absence). Surprisingly, union support does not significantly correlate with any of the dependent variables.

Is Union Support a Substitute for or Complement to Other Forms of Social Support?

One of the primary purposes of this study was to examine the role of unions as a unique form of social support at work. House (1981) proposed that union stewards have the potential to replace or complement supervisors as sources of work-related support. However, the analyses of main effects do not show union stewards as providing support equal to or greater than that provided by supervisors or co-workers.

Although it is difficult to know exactly why this occurred, the most pervasive explanation has to do with the union's lack of strength in the organization. Only about 20 percent of physical plant employees belong (pay dues) to the union and a very small percentage of those actually participate in union activities (attend meetings, hold office, vote, etc.). In fact, the union is viewed, especially by management and to some degree by employees, as a very weak force.

On the other hand, the two departments utilized for this study report having 41 percent union members and these units were specifically chosen because of their high union involvement. It may be that union stewards have not been taught how to exhibit supportive behavior toward fellow employees (see Lerner & Schore, 1982) or that stress reduction among employees has not been a major focus of these locals due to more pressing concerns.

Is There a Moderating Effect of Social Support on the Relationships between Objective Physical Danger and Strain?

Out of the four strains studied, only the relationship between objective danger and absence frequency was buffered, or moderated, by social support. The significant negative interaction between co-worker support and objective danger indicates that, under conditions of high co-worker support, objective danger results in less absence than under conditions of low co-worker support.

This is an interesting finding for two reasons. First, there is only one other investigation that has obtained buffering effects on behavioral strain. House (Note 2) found that supervisor support moderated drinking behavior of employees. Because of the paucity of significant results, behavioral strains were thought to be less susceptible to buffering than psychological strains.

Second, it is valuable to know that co-worker support might mitigate the objective danger-absence relationship. In other words, when the job is objectively dangerous, absence may be minimized if peer support or cohesiveness is high. This seems to serve as a protective device in that each person is more likely to be present to share his or her part of the work so that no one individual is "over" exposed to danger.

Unfortunately, the union support x objective danger interaction is more difficult to explain. Its positive correlation with absence suggests that, if union support is high, objective danger leads to more absence than if union support is low. Although "reverse" buffering effects have precedence in the literature, there is no consensus on how to interpret them. Blau (1981) and Pinneau (1975/1976) discounted them as artifacts due to chance based on the few significant interactions obtained in their samples. Abdel-Halim (1982) and House (Note 2) made an attempt to interpret them in their studies.

One possible explanation for the current finding is that union stewards encourage employees to stay home if the work is extremely dangerous or if proper safety standards are not being enforced by the organization. However, since both interaction terms dropped to insignificance in the reduced models, the more persausive explanation for both results is that they are chance findings or perhaps spurious effects due to the presence of the other interaction terms in the full model.

Is There a Moderating Effect of Social Support on the Relationships between Perceived Physical Danger and Strain?

In the perceived danger model, all of the strains, except physical symptoms, were moderated by a social support x stressor interaction. However, only one was in the expected direction.

Psychological Strain. Supervisor support in interaction with perceived danger exerted a negative effect on emotional exhaustion. In the presence of high supervisor support, perceived danger resulted in less emotional exhaustion than when supervisor support was low. In other words, supportive leader behavior buffered the stressor-strain relationship in the way the stress model and various theorists would have predicted. This finding is supported in the literature, if the effect of supervisor support is considered on all psychological strains (Billings & Moos, 1982; Karasek et al., 1982; LaRocco et al., 1980).

Both of the other interactions suggest reverse buffering. Co-worker support x perceived danger produced a positive correlation with state anxiety. Under conditions of high co-worker support, perceived danger resulted in more anxiety than when co-worker support was low. Abdel-Halim (1982) also found a positive relationship between job stressors and anxiety for individuals who had strong work-group support. He explains this phenomenon by saying that when peers open up to each other and self-disclose, they may feel anxiety over having exposed their personal weaknesses or inadequacies to the group. It is conceivable that this mechanism was operating with the current sample. For example, there may be a heavy trade-off between receiving support from co-workers concerning danger on the job and feelings of anxiety or shame because of admitting their fears. This could especially be a problem for blue-collar workers who feel the need to preserve their masculine images with friends and fellow workers.

Behavioral Strain. The interaction between union support and perceived danger is positively related to absence frequency. This moderating effect is comparable to the one in the objective model: when union support is high, perceived danger associated with the job leads to more absence than when union support is low. As with objective danger, high levels of union support may create an atmosphere where boycotting work is acceptable when perceived danger is an issue. In addition, workers may feel protected against punitive actions by management in situations where union support is perceived as strong.

However, the question arises again about interpretation of findings that do not hold up in a simpler model. Only the interaction between co-worker support and perceived danger significantly relates to strain (anxiety) in the reduced models and that buffering effect is in the opposite direction than predicted by the theoretical model used to guide this investigation.

Implications for Future Research

Objective Versus Perceived Stressors

Although objective physical danger and perceived physical danger were significantly correlated ($p < 0.01$) in this study, it is imperative that future stress studies validate whether subjective stressors are grounded in reality for their particular samples. It is also important to measure the same stressors objectively and perceptually, assess their effects separately on strain or health, and then look at their independent contributions to stress outcomes when considered in the same model. Only systematic research strategies such as these will answer the questions posed by House (Note 2) regarding ". . . how, why, and to what extent objective conditions of work, or of life more generally, influence individuals' perceptions of stress . . ." (p. 103).

Physical Danger as a Stressor

It appears that physical danger holds some unique promise as a workplace stressor--not only for occupations usually associated with hazardous work such as policing, but also for many other workers whose exposure to danger is underestimated and probably underappreciated. There are multiple avenues for research in this area: (1) exploring danger in other occupations where risk is not obvious; (2) investigating physical and emotional danger in the same sample; (3) comparing objective physical and emotional danger with perceived physical and emotional danger as stressors; and (4) developing a typology of dangerous work based on the four categories mentioned above. In addition, the evidence from this study indicates that the danger dimension of the PAQ could provide a standardized measure of objective physical danger that is relatively easy to use and which produces consistent results. In fact, there are several dimensions of the PAQ which seem potentially useful as objective measures of workplace stressors.

Unions as a Form of Social Support

Although union support was not a substitute for or complement to supervisor and co-worker support in this sample, the concept warrants further investigation in a different setting. As stated earlier, the union representing these employees was not a strong force.

Consequently, to adequately determine the potential of unions as a source of social support, studies should be conducted in organizations where the union is viewed as an entity with a power base equivalent to that of management.

The General Stress Model

The conflicting results from previous studies, including this one, might suggest that further research is warranted on the role of conditioning variables and their ability to moderate or buffer various relationships in the model. However, it is unclear how much empirical investigation on a topic constitutes enough to conclude that the concept, its measurement, or its analysis is deficient. The time has probably come to rethink the role of social support as a buffer, and then to either change strategies or abandon the whole buffering idea.

The other glaring implication of the stress model is the need for longitudinal studies (as opposed to cross-sectional ones) to adequately test the proposed linkages. However, this will always pose serious problems to researchers because such studies necessitate identification of respondents in order to match up data from various points in time. Since questions regarding workplace stressors, attitudes and behaviors tend to be sensitive ones, there is likely to be a trade-off between complete honesty and obtaining critical time-series data.

Implications for Organizational Practice

Physical Danger as a Stressor

One of the major implications for practice emanating from this study involves the fact that objective and perceived physical danger at work are viewed as stressors by employees and negatively influence strain outcomes. This means that organizations need to make a careful assessment of each job and determine the degree of hazard, both objective and perceived, associated with performing the job. If objective danger exists, then every safety precaution should be implemented to insure the job-holders protection and the employee should be informed of such safeguards. If the danger is mainly perceptual, then the appropriate psychological supports should be readily available in order to prevent or decrease experienced strain.

Danger of any sort that is associated with doing the job should be considered by the employing organization as their moral and legal responsibility and they should take an active role in protecting workers from negative consequences resulting from danger.

Social Support as an Intervention

The results of this study emphasize the importance of supervisor and co-worker support at work in alleviating strain for employees. Is the organization, then, to assume all is well and that superiors and peers will supply employees with their quota of social support? Obviously, this is an unrealistically rosy picture because there is no evidence that individuals "instinctively" provide social support to others. However, organizations can take an active part in the process by selecting supervisors who are high in relationship skills and by developing such skills in those already occupying leadership positions. In addition, the organization can make a concerted effort to distribute rewards based on supportive supervisor behaviors.

The organization also has a responsibility to develop and nurture co-worker support among employees. Work groups should remain as stable as possible, and substitutions or pulling individuals out of the group should be minimal. In addition, breaks and lunch periods could be scheduled at the same time to allow for more interaction time between peers. Every effort made by management to build cohesive work groups should ultimately pay off by increasing support levels among employees and decreasing strain.

The non-significant findings on union support suggest that unions also need to engage in training programs on stress reduction and supportive behavior for stewards and other union officials. This strategy would be especially important if unions desire to take an active role in protecting their members from the deleterious effects of workplace stressors.

Conclusions

Although it may seem that this study has raised more questions than it has provided answers for, there are several major conclusions that can be stated.

First, there is considerable evidence that both objective and perceived physical danger are important work-place stressors for blue-collar employees. Objective and perceived danger were significantly correlated and perceived danger predicted all four strain outcomes. In fact, danger may be a more salient task characteristic for those in mundane, blue-collar jobs due to their chronic, continuous exposure than for police and firefighters who experience hours and hours of safety interspersed with a few minutes of extreme risk.

Second, it appears that union stewards are not a dominant source of social support for this sample. There were no significant main effects from union support on strain and the two interactions were in the opposite direction than predicted. However, the factor analysis of the support variables and the bivariate correlations indicate that employees have distinct, independent concepts of supervisor, co-worker and union support. The next research step may be to test the union support hypotheses in organizations with strong unions.

Last, there is a great deal of support for most of the direct and indirect linkages in the stress model. The objective stressor was positively related to the perceived stressor, and the perceived stressor was positively related to all four strains. Two of the three conditioning variables exerted negative main effects on selected strains. Only the direct linkage between the objective stressor and strain was unsupported.

In terms of buffering effects of social support on strain in the model, the evidence is not clear. There were five significant interactions between stressors and social support, but only two of them (eight percent) are in the hypothesized direction. When considered in a reduced model, only one interaction remains significant and it is in the reverse direction. It appears, then, that the major impact of social support in this sample comes from supervisor and co-worker main effects.

The results of this study and the many others that were reviewed suggest that the dichotomy between main effects of social support and buffering effects may be an artificial one that is important statistically, but not conceptually. Sidney Cobb (1979), one of the pioneers in developing a theory of social support, describes this perspective best:

> Some of the effects of social support appear to be direct or main effects and others appear as interactions with stresses in the social environment. In my view, it is not worth worrying about the distinction between main effects and interaction effects, for several reasons. The first is that few if any lives are entirely free of social and psychological stress so, when main effects appear, it may be that unmeasured stresses are producing an interaction effect that is large enough to appear

> also as a main effect. The second point is that it is quite reasonable to imagine that at very low levels of social support the deprivation would be strong enough to be a stress in itself, while at medium levels it would take some other environmental stress to highlight the deficit, and at the highest levels protection from strain might be very substantial. There are many faults in the various studies, but the repetitive nature of the effects using varied techniques is impressive. The pervasiveness of these social support effects suggests that we are dealing with a very general phenomenon and a really fundamental variable. One cannot escape the conclusion that the world would be a healthier place if training in supportive behavior were built into the routines of our homes and schools, and support worker roles were institutionalized. (pp. 99, 103)

APPENDIX A
PRELIMINARY LETTER TO EMPLOYEES

July 15, 1983

Dear Physical Plant Employee:

During the week beginning July 25, 1983, a questionnaire survey will be given to all employees in the Physical Plant Division by two University of Florida researchers. It will include a number of questions which will ask for your opinions about job related matters and descriptions of your health. The purpose of the study is to better understand stress at work. The survey will take about 45 minutes to complete. Time has been scheduled during normal working hours so that everyone can participate.

This project has been reviewed by my office and approved. The American Federation of State, County and Municipal Employees (AFSCME), Locals 1906 and 3171, has also reviewed and endorsed the project. I believe all of us will benefit from a better understanding of the stresses facing members of the Physical Plant and their reactions to those stresses. The information gathered may also help people in similar jobs elsewhere learn how to identify and reduce work stress. The University of Florida researchers have agreed to discuss the results of the survey with all interested parties and will distribute their findings in a summary letter to each employee.

Although no one in the Physical Plant Division or AFSCME, Locals 1906 and 3171, will ever see your individual answers under any circumstances, the questionnaire will be designed so that individuals cannot be easily identified. Your responses are for research purposes only, will never be used to evaluate you, and will be kept strictly confidential by the researchers. There is no reason to identify individuals and no names will be required. The information provided by you will be analyzed by the researchers and presented to Physical Plant and AFSCME representatives in summary form only.

We encourage you to be as sincere as possible in your descriptions of and reactions to your work. All parties need your honest answers and cooperation if this project is to be successful.

Sincerely,

Robert D. Cremer, Jr., Director
Physical Plant Division

FDC/JJ:jt

APPENDIX B
RESEARCHER'S INTRODUCTION

I. Introduction

- A. Jeannie Gaines
- B. Doctoral student at University of Florida College of Business

II. Why I'm interested in Physical Plant

- A. Nursing background created an interest in how people's jobs affect their health and their lives in general.
- B. Dissertation requires original resarch in an area of interest.

III. Why should you be interested in participating in the study?

- A. Results will be disseminated to each individual.
- B. Results will be presented in summary to administration and union officials.

IV. Anonymity/Confidentiality

- A. No one in management, in the union or anyone else in the organization will ever see your questionnaire or individual answers.
- B. The brown envelopes you've been given to place the questionnaires in will remain sealed until after the survey. The information will then be transferred to computer cards and the questionnaires will be destroyed.
- C. No names are required--only your honest answers.

V. Instructions for filling out survey

- A. This is not a test; there are no right or wrong answers.
- B. Go over first two or three questions with them.
- C. All supervisor questions refer to your immediate supervisor or superior.
- D. Please ask for help if some of the questions seem confusing.

E. When you finish, place the survey in the brown envelope provided, seal it and return it to me.

VI. In advance, thank you for your help in doing this project.

APPENDIX C
BACKGROUND INFORMATION

1. What is your age?

    1. less than 20 years
    2. 20 to 25 years
    3. 26 to 30 years
    4. 31 to 35 years
    5. 36 to 40 years
    6. 41 to 45 years
    7. 46 to 50 years
    8. 51 to 55 years
    9. 56 to 60 years
    10. greater than 60 years

2. Sex?

    1. Male
    2. Female

3. How long have you been employed in your present job?

    1. less than 6 months
    2. 6 months to 1 year
    3. 1 year to 2 years
    4. 2 years to 5 years
    5. 5 years to 7 years
    6. 7 years to 10 years
    7. 10 years to 15 years
    8. 15 years to 20 years
    9. more than 20 years

4. Are you a dues paying member of AFSCME, Local 1906 or Local 3171?

    1. No
    2. Yes

5. Which department do you work in?

    1. Administration
    2. Building Services
    3. Energy Management
    4. Engineering
    5. Grounds
    6. Maintenance and Construction
    7. Telecommunications
    8. Utilities
    9. Other ______________________ (please list)

6. Select your job title from the list below and indicate in the space provided.

    1. Accountant I
    2. Account Clerk II
    3. Accounting Clerk II
    4. Administrative Assistant II
    5. Assistant Superintendant
    6. Assistant Supervisor I
    7. Auto Equipment Mechanic I
    8. Building Construction Coordinator
    9. Building Inspector
    10. Cabinet Maker
    11. Carpenter
    12. Centrex Operator
    13. Clerk II
    14. Clerk III
    15. Clerk IV
    16. Clerk Typist III
    17. Construction Cost Estimator
    18. Custodial Worker
    19. Data Entry Operator
    20. Electrician
    21. Electronic Technician I
    22. Electronic Technician II
    23. Engineer I
    24. Engineer II
    25. Engineer III
    26. Engineering Technician II
    27. Engineering Technician IV
    28. Fiscal Assistant I
    29. Foreman
    30. Groundskeeper I
    31. Groundskeeper II
    32. Heavy Equipment Operator I
    33. Heavy Equipment Operator II
    34. Laborer
    35. Landscape Designer I
    36. Landscape Designer II
    37. Locksmith I
    38. Locksmith II
    39. Maintenance Mechanic
    40. Maintenance Repairman
    41. Management Analyst
    42. Mason
    43. Motor Vehicle Operator I
    44. Motor Vehicle Operator II
    45. Nursery Assistant
    46. Operating Engineer I
    47. Operating Engineer II
    48. Painter
    49. Plumber
    50. Purchasing Agent III
    51. Refrigeration Mechanic
    52. Roofer
    53. Secretary III
    54. Secretary IV
    55. Sheet Metalworker
    56. Staff Assistant
    57. Steam Fitter
    58. Stock Clerk
    59. Storekeeper I
    60. Storekeeper II
    61. Stores Manager
    62. Superintendent I
    63. Superintendent II
    64. Supervisor I
    65. Supervisor II
    66. Supervisor III
    67. Supervisor IV
    68. Trades Helper
    69. Treatment Plant Operator I
    70. Treatment Plant Operator II
    71. Tree Surgeon
    72. Utilities Mechanic
    73. Welder
    74. Other ____________________
    (please list)

______

APPENDIX D
OBJECTIVE PHYSICAL DANGER

Supervisor's Name ________________________________

Department ________________________________

Position Rated ________________________________

I. The four questions which follow describe accidents or illnesses which may result from exposure to hazards at work. Please rate the possibility of the occurrence of each of the types of accidents/illnesses to the typical worker on this job using the responses below. In making the ratings, consider the safety/accident record of employees on this job, and/or the possibility of accidents due to such factors as: traveling at high speeds, being in high places, working with machinery, sharp tools, hot or very cold materials, exposure to falling objects, dangerous chemicals, explosives, toxic fumes, radiation, etc.

0. No possibility
1. Very limited possibility
2. Limited possibility
3. Moderate possibility
4. Fairly high possibility
5. High possibility

1. First-aid cases (minor injuries or illnesses which typically result in a day of less of "lost" time and are usually remedied with first-aid procedures). ______

2. Temporary disability (temporary injuries or illnesses which prevent the worker from performing his job from one full day up to extended periods of time but which do not result in permanent disability or impairment). ______

3. Permanent partial impairment (injuries or illnesses resulting in the amputation or permanent loss of use of any body member or part thereof, or permanent impairment of certain body functions). ______

4. Permanent total disability/death (injuries or illnesses which totally disable the worker and permanently prevent his further gainful employment, for example, loss of life, sight, limbs, hands, or radiation sickness, etc.). _____

Note: Items from the Position Analysis Questionnaire, copyright 1979 by Purdue Research Foundation, West Lafayette, Indiana 47907. Reprinted by permission.

APPENDIX E
PERCEIVED PHYSICAL DANGER

Here are some general questions about what your job is like. Please use the following responses:

1. Almost always untrue
2. Usually untrue
3. Sometimes true, sometimes untrue
4. Usually true
5. Almost always true

1. My job is physically dangerous. ______

2. I encounter personally hazardous situations while at work. ______

3. I am directly exposed to physical harm in carrying out my job. ______

4. I worry about being injured while working. ______

5. The tasks I perform at work are safe (R). ______

6. On my job, it is easy to get hurt. ______

APPENDIX F
STATE ANXIETY

Please use the scale below to describe how you feel while working on your job.

1. Not at all
2. Somewhat
3. Moderately
4. Very much so

1. I feel calm. ______

2. I am tense. ______

3. I feel upset. ______

4. I feel nervous. ______

Note: Selected items. Reproduced by special permission of the publisher, Consulting Psychologists Press, Inc., Palo Alto, CA 94306, from the State Trait Anxiety Inventory by Charles Spielberger and Associates, Copyright 1.1968. Further reproduction is prohibited without the publisher's consent.

APPENDIX G
EMOTIONAL EXHAUSTION

On this page are several statements about job-related feelings you might have had. Please indicate how often you experience the feeling by using the following responses:

0. Never
1. A few times a year
2. Monthly
3. A few times a month
4. Weekly
5. A few times a week
6. Daily

1. I feel emotionally drained from my work. ______

2. I feel used up at the end of the workday. ______

3. I feel burned out from my work. ______

4. I feel I'm working too hard on my job. ______

Note: Selected items. Reproduced by special permission of the publisher, Consulting Psychologists Press, Inc., Palo Alto, CA 94306, from the Maslach Burnout Inventory by Christine Maslach and Susan Jackson, Copyright 2.1981. Further reproduction is prohibited without the publisher's consent.

APPENDIX H
PHYSICAL SYMPTOMS

Here is a list of physical symptoms. Please use the following responses to describe how often each of these has happened to you in the past three months.

1. Never
2. Once in a while
3. Sometimes
4. Fairly often
5. Very often

1. A weight gain or loss of 10 pounds or more (excluding diets). ______
2. Trouble getting to sleep. ______
3. Trouble staying asleep. ______
4. Becoming tired in a short time. ______
5. Rash or breaking out on your skin. ______
6. Unusual hair loss. ______
7. Excessive dryness or itching of skin. ______
8. Sweating so that you feel damp and clammy. ______
9. Headaches. ______
10. Blurred vision. ______
11. Difficulty swallowing. ______
12. Dizziness. ______
13. Nosebleeds. ______
14. Ringing in your ears. ______

15. Shortness of breath. ______

16. Heavy coughing. ______

17. Tightness or heaviness in your chest. ______

18. Chest colds. ______

19. Swollen ankles or feet. ______

20. Pains in your heart. ______

21. Feeling your heart pounding or racing. ______

22. High blood pressure. ______

23. Poor appetite. ______

24. Pains in your stomach. ______

25. Diarrhea. ______

26. Indigestion or acid stomach. ______

27. Nausea or vomiting. ______

28. Weakness. ______

29. Stiffness, swelling or aching in your joints or muscles. ______

30. Muscle cramps. ______

31. Pains in your back and spine. ______

APPENDIX I
ABSENCE FREQUENCY

Not counting paid vacation days and holidays, how many days that you were supposed to work have you missed in the last three months?

______ days

How long were you away from work each time you were absent?

First absence was for ______ days.

Second absence was for ______ days.

Third absence was for ______ days.

Fourth absence was for ______ days.

Fifth absence was for ______ days.

Sixth absence was for ______ days.

Seventh absence was for ______ days.

Eighth absence was for ______ days.

Ninth absence was for ______ days.

Tenth absence was for ______ days.

APPENDIX J
SOCIAL SUPPORT

Please answer these questions about each person or group by using the following responses:

1. Not at all
2. A little
3. Some
4. Pretty much
5. Very much

	Your Supervisor	Your Co-workers	Your Union Steward
How much do each of these people go out of their way to make your work life easier for you?	1. ______	6. ______	11. ______
How easy is it to talk with each of the following people?	2. ______	7. ______	12. ______
How much can each of these people be relied on when things get tough at work?	3. ______	8. ______	13. ______
How freely can you express your feelings to the following people?	4. ______	9. ______	14. ______
How much is each of the following people willing to listen to your personal problems?	5. ______	10. ______	15. ______

REFERENCE NOTES

1. Caplan, R. D., Cobb, S., French, J. R. P., Jr., Harrison, R. V., & Pinneau, S. R., Jr. *Job demands and worker health* (ISR Code No. 9011). Ann Arbor: University of Michigan Institute for Social Research, 1980.

2. House, J. S. *Occupational stress and the mental and physical health of factory workers* (ISR Code No. 9009). Ann Arbor: University of Michigan Institute for Social Research, 1980.

3. Parasuraman, S. *Managerial Coping Behaviors: An examination of their relationship with job stressors and felt stress*. Paper presented at the National Academy of Management Meetings, New York, August 1982.

4. House, J. S. Personal communication, October 7, 1982.

5. Jermier, J. M. *Physical danger at work: It's meaning and measurement*. Unpublished manuscript, 1982. (Available from University of South Florida, Department of Management, Tampa, FL)

6. Quinn, R. P., & Staines, C. L. *The 1977 Quality of Employment Survey* (ISR Code No. 4106). Ann Arbor: University of Michigan Institute for Social Research, 1979.

7. Pinneau, S. R. *Complementarity and social support*. Unpublished manuscript, University of Michigan Institute for Social Research, 1972.

8. McIntosh, N. J. *The effect of client characteristics on burnout among helping professionals*. Doctoral Dissertation, University of Florida, in process.

REFERENCES

Abdel-Halim, A. A. Social support and managerial affective responses to job stress. Journal of Occupational Behaviour, 1982, 3, 281-295.

Andrews, G., Tennant, C., Hewson, D. M., & Vaillant, G. E. Life event stress, social support, coping style, and risk of psychological impairment. The Journal of Nervous and Mental Disease, 1978, 166, 307-316.

Armstrong, K. L. An exploratory study of the interrelationships between worker characteristics, organizational structure, management process, and worker alienation from clients. (Doctoral dissertation, University of California, Berkeley, 1977.) Dissertation Abstracts International, 1978, 39, 670B.

Baumgartel, H., & Sobol, R. Background and organizational factors in absenteeism. Personnel Psychology, 1959, 12, 431-443.

Beehr, T. A., & Newman, J. E. Job stress, employee health, and organizational effectiveness: A facet analysis, model, and literature review. Personnel Psychology, 1978, 31, 665-699.

Beehr, T. A., Walsh, J. T., & Taber, T. D. Relationship of stress to individually and organizationally valued states: Higher order needs as a moderator. Journal of Applied Psychology, 1976, 61, 41-47.

Belloc, N., Breslow, L., & Hochstim, J. Measurement of physical health in a general population survey. American Journal of Epidemiology, 1971, 93, 328-329.

Billings, A. C., & Moos, R. H. Work stress and the stress-buffering roles of work and family resources. Journal of Occupational Behaviour, 1982, 3, 215-232.

Blau, G. An empirical investigation of job stress, social support, service length, and job strain. Organizational Behavior and Human Performance, 1981, 21, 279-302.

Bragg, J. E., & Andrews, I. R. Participative decision making: An experimental study in a hospital. Journal of Applied Behavioral Science, 1973, 9, 727-734.

Brief, A. P., & Aldag, R. J. Correlates of role indices. Journal of Applied Psychology, 1976, 61, 468-472.

Brief, A. P., Schuler, R. S., & Van Sell, M. Managing job stress. Boston: Little, Brown, 1981.

Bryant, F. B., & Veroff, J. The structure of psychological well-being: A sociohistorical analysis. Journal of Personality and Social Psychology, 1982, 43, 643-673.

Burke, R. J., & Weir, T. Giving and receiving help with work and nonwork related problems. Journal of Business Administration, 1975, 6, 59-78.

Burke, R. J., & Weir, T. Managers' perceptions of effective, ineffective and nonhelpers. Journal of Business Administration, 1976, 7, 51-65.

Burke, R. J., & Weir, T. Coping with the stress of managerial occupations. In C. L. Cooper and R. Payne (Eds.), Current concerns in occupational stress. New York: John Wiley, 1980.

Burke, R. J., Weir, T., & Duncan G. Informal helping relationships in work organizations. Academy of Management Journal, 1976, 19, 370-377.

Cannon, W. B. Organization for physiological homeostasis. Physiological Review, 1929, 9, 339-430.

Caplan, G. Support systems and community mental health. New York: Behavioral Publications, 1974.

Caplan, R. D. Social support, person-environment fit and coping. In L. A. Ferman & J. P. Gordus (Eds.), Mental health and the economy. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research, 1979.

Caplan, R. D., & Jones, K. W. Effects of work load, role ambiguity, and type A personality on anxiety, depression, and heart rate. Journal of Applied Psychology, 1975, 60, 713-719.

Cassel, J. The use of medical records: Opportunity for epidemiological studies. Journal of Occupational Medicine, 1963, 5, 185-190.

Cassel, J. The contribution of the social environment to host resistance. American Journal of Epidemiology, 1976, 104, 107-123.

Cassel, J., & Tyroler, H. A. Epidemiological studies of culture change. Archives of Environmental Health, 1961, 3, 25-33.

Chadwick-Janes, J. K., Brown, C. A., Nicholson, N., & Sheppard, C. Absence measures: Their reliability and stability in an industrial setting. Personnel Psychology, 1971, 24, 463-470.

Cherniss, C. Professional burnout in human service organizations. New York: Praeger Publishers, 1980.

Cobb, S. Social support as a moderator of life stress. Psychosomatic Medicine, 1976, 38, 300-314.

Cobb, S. Social support and health through the life course. In M. W. Riley (Ed.), Aging from birth to death. Boulder, CO: Westview Press, 1979.

Coburn, D. Job-worker incongruence: Consequences for health. Journal of Health and Social Behavior, 1975, 16, 198-212.

Coburn, D. Work and general psychological and physical well-being. International Journal of Health Services, 1978, 8, 415-435.

Cohen, A. The influence of a company hearing conservation program on extra-auditory problems in workers. Journal of Safety Research, 1976, 8, 146-162.

Colligan, M. J., & Murphy, L. R. Mass psychogenic illness in organizations: An overview. Journal of Occupational Psychology, 1979, 52, 77-90.

Cooper, C. L. Social support at work and stress management. Small Group Behavior, 1981, 12, 285-297.

Cooper, C. L., & Marshall, J. Occupational sources of stress: A review of the literature relating to coronary heart disease and mental health. Journal of Occupational Psychology, 1976, 49, 11-28.

Cooper, R. Task characteristics and intrinsic motivation. Human Relations, 1973, 26, 387-413.

Corrigan, R. S., Lester, D., & Loftus, T. Perception of danger by police officers. Perceptual and Motor Skills, 1980, 50, 284.

Eaton, W. W. Life events, social supports, and psychiatric symptoms: A re-analysis of the New Haven data. Journal of Health and Social Behavior, 1978, 19, 230-234.

Eden, D. Critical job events, acute stress, and strain: A multiple interrupted time series. Organizational Behavior and Human Performance, 1982, 30, 312-329.

Ferguson, D. A study of occupational stress and health. Ergonomics, 1973, 16, 649-664.

Fiedler, F. E. A theory of leadership effectiveness. New York: McGraw-Hill, 1967.

Fitzpatrick, J. S. Adapting to danger: A participant observation study of an underground mine. Sociology of Work and Occupations, 1980, 7, 131-158.

Fleishman, E. A., Harris, F. F., & Burtt, N. E. Leadership and supervision in industry. Columbus: The Ohio State University, 1955.

French, J. R. P. Person role fit. In A. McLean (Ed.), Occupational stress. Springfield, IL: Charles C. Thomas, 1974.

French, J. R. P., Jr., & Caplan, R. D. Organizational stress and individual strain. In A. J. Marrow (Ed.), The failure of success. New York: AMACOM, 1972.

Fried, J., Weitman, M., & Davis, M. K. Man-machine interaction and absenteeism. Journal of Applied Psychology, 1972, 56, 428-429.

Gaines, J., & Jermier, J. M. Emotional exhaustion in a high stress organization. Academy of Management Journal, 1983, 26, 567-586.

Ganster, D. C., Mayes, B. T., Sime, W. E., & Tharp, C. D. Managing organizational stress: A field experiment. Journal of Applied Psychology, 1982, 67, 533-542.

Gardell, B. Arbetsinnehal och livskvalitet. Stockholm: Prisma, 1976.

Gavin, J. F., & Axelrod, W. L. Managerial stress and strain in a mining organization. Journal of Vocational Behavior, 1977, 11, 66-74.

Gore, S. The influence of social support and related variables in ameliorating the consequences of job loss. (Doctoral Dissertation, University of Pennsylvania, 1973). Dissertation Abstracts International, 1974, 34, 5330A-5331A. (University Microfilms No. 74-2416).

Gore, S. The effect of social support in moderating the health consequences of unemployment. Journal of Health and Social Behavior, 1978, 19, 157-165.

Gupta, N., & Beehr, T. A. Job stress and employee behaviors. Organizational Behavior and Human Performance, 1979, 23, 373-387.

Gurin, C., Veroff, J., & Feld, S. Americans view their mental health: A nationwide survey. New York: Basic Books, 1960.

Haas, J. Learning real feelings: A study of high steel ironworkers' reactions to fear and danger. Sociology of Work and Occupations, 1977, 4, 147-170.

Hackman, J. R., & Lawler, E. E. Employee reactions to job characteristics. Journal of Applied Psychology, 1971, 55, 259-286.

Hackman, J. R., & Oldham, G. R. Motivation through the design of work: Test of a theory. Organizational Behavior and Human Performance, 1976, 16, 250-279.

Hackman, J. R., Pearce, J. L., & Wolfe, J. C. Effects of changes in job characteristics on work attitudes and behaviors: A naturally occurring quasi-experiment. Organizational Behavior and Human Performance, 1978, 21, 289-304.

Hammer, T. H., & Landau, J. Methodological issues in the use of absence data. Journal of Applied Psychology, 1981, 66, 574-581.

Hamner, W. C., & Tosi, H. L. Relationship of role conflict and role ambiguity to job involvement measures. Journal of Applied Psychology, 1974, 59, 497-499.

Hedges, J. N. Absence from work: A look at some national data. Monthly Labor Review, 1973, 96, 24-30.

House, J. S. Occupational stress and coronary heart disease: A review and theoretical integration. Journal of Health and Social Behavior, 1974, 15, 12-27.

House, J. S. Work stress and social support. Reading, MA: Addison-Wesley, 1981.

House, J. S., Wells, J. A., Landerman, L. W., McMichael, A. J., & Kaplan, B. H. Occupational stress and health among factory workers. Journal of Health and Social Behavior, 1979, 20, 139-160.

House, R. J., & Rizzo, J. R. Role conflict and ambiguity as critical variables in a model of organizational behavior. Organizational Behavior and Human Performance, 1972, 7, 467-505.

Ittleson, W. H. Environmental perception and urban experience. Environment and Behavior, 1978, 10, 192-213.

Ivancevich, J. M. Effects of the shorter workweek on selected satisfaction and performance measures. Journal of Applied Psychology, 1974, 59, 717-721.

Ivancevich, J. M., & Matteson, M. T. Optimizing human resources: A case for preventive health and stress management. Organizational Dynamics, Autumn 1980, pp. 5-25.

Jackson, S. E. Participation in decision making as a strategy for reducing job-related strain. Journal of Applied Psychology, 1983, 68, 3-19.

Jacobson, D. Fatigue-producing factors in industrial work and preretirement attitudes. Occupational Psychology, 1972, 46, 193-200.

Jenkins, C. D., Rosenman, R. H., & Friedman, M. Development of an objective psychological test for the determination of the coronary-prone behavior pattern. Journal of Chronic Diseases, 1967, 20, 371-379.

Jermier, J. M. Ecological hazards and organizational behavior: A study of dangerous urban space-time zones. Human Organization, 1982, 41, 198-207.

Johns, C. Attitudinal and nonattitudinal predictors of two forms of absence from work. Organizational Behavior and Human Performance, 1978, 22, 431-444.

Johns, C., & Nicholson, N. The meanings of absence: New strategies for theory and research. In B. M. Staw and L. L. Cummings (Eds.), Research in organizational behavior (Vol. 4). Greenwich, CN: JAI Press, 1982.

Kafry, D., & Pines, A. The experience of tedium in life and work. Human Relations, 1980, 33, 477-503.

Kahn, R. L., & Antonucci, T. C. Convoys over the life course: Attachment, roles, and social support. In P. B. Baltes & O. C. Brim (Eds.), Life-span development and behavior (Vol. 3). New York: Academic Press, 1980.

Kahn, R. L., Wolfe, D. M., Quinn, R. P., & Snoek, J. D. Organizational stress: Studies in role conflict and ambiguity. New York: John Wiley, 1964.

Karasek, R. A. Job demands, job decision latitude, and mental strain: Implications for job redesign. Administrative Science Quarterly, 1979, 24, 285-307.

Karasek, R. A., Triantis, K. P., & Chaudhry, S. S. Coworker and supervisor support as moderators of associations between task characteristics and mental strain. Journal of Occupational Behaviour, 1982, 3, 181-200.

Kasl, S. V. Mental health and the work environment: An examination of the evidence. Journal of Occupational Medicine, 1973, 15, 505-518.

Kasl, S. V. Epidemiological contributions to the study of work stress. In C. L. Cooper & R. Payne (Eds.), Stress at work. New York: John Wiley, 1978.

Katz, D., & Kahn, R. L. The social psychology of organizations (2nd ed.). New York: John Wiley, 1978.

Kilbridge, M. D. Turnover, absence, and transfer rates as indicators of employee dissatisfaction with repetitive work. Industrial and Labor Relations Review, 1961, 15, 21-32.

Kohn, M. L., & Schooler, C. Class, occupation, and orientation. American Sociological Review, 1969, 34, 659-678.

Kroes, W. H. Society's victim--the policeman: An analysis of job stress in policing. Springfield, IL: Charles C. Thomas, 1976.

Langner, T. S. A twenty-two item screening score of psychiatric symptoms indicating impairment. Journal of Health and Social Behavior, 1962, 3, 269-276.

LaRocco, J. M., House, J. S., & French, J. R. P. Social support, occupational stress, and health. Journal of Health and Social Behavior, 1980, 21, 202-218.

LaRocco, J. M., & Jones, A. P. Co-worker and leader support as moderators of stress-strain relationships in work situations. Journal of Applied Psychology, 1978, 63, 629-634.

Lauderdale, M. Burnout. San Diego: University Associates, 1982.

Lazarus, R. S. Psychological stress and the coping process. New York: McGraw-Hill, 1966.

Lerner, M., & Schore, L. Occupational stress and labor organizing. Socialist Review, 1982, 12, 121-139.

Likert, R. New patterns of management. New York: McGraw-Hill, 1961.

Likert, R. The human organization. New York: McGraw-Hill, 1967.

Lin, N., Simeone, R. S., Ensel, W. M., & Kuo, W. Social support, stressful life events, and illness: A model and an empirical test. Journal of Health and Social Behavior, 1979, 20, 108-119.

MacMillan, A. M. The health opinion survey: Techniques for estimating prevalence of psychoneurotic and related types of disorder in communities. Psychological Reports, 1957, 3, 325-339.

McCormick, E. J., Jeanneret, P. R., & Mecham, R. C. A study of the job characteristics and job dimensions as based on the Position Analysis Questionnaire (PAQ). Journal of Applied Psychology, 1972, 56, 347-367.

McGrath, J. E. A conceptual formulation for research on stress. In J. E. McGrath (Ed.), Social and psychological factors in stress. New York: Holt, Rinehart, & Winston, 1970.

McGrath, J. E. Methodological problems in research on stress. In H. W. Krohne (Ed.), Achievement, stress, and anxiety. Washington, D.C.: Hemisphere, 1982.

McMichael, A. J. Personality, behavioural, and situational modifiers of work stressors. In C. L. Cooper & R. Payne (Eds.), Stress at work. New York: John Wiley, 1978.

Margolis, B. L., Kroes, W. H., & Quinn, R. P. Job stress: An unlisted occupational hazard. Journal of Occupational Medicine, 1974, 16, 659-661.

Marmot, M. G. Acculturation and coronary heart disease in Japanese Americans. Unpublished Doctoral Dissertation, University of California, Berkeley, 1975.

Marmot, M. G., Syme, S. L., Kagan, A., Kato, H., Cohen, J. B., & Belsky, J. Epidemiologic studies of coronary heart disease and stroke in Japanese men living in Japan, Hawaii, and California: Prevalence of coronary and hypertensive heart disease and associated risk factors. American Journal of Epidemiology, 1975, 102, 514-525.

Maslach, C. Burned-out. Human Behavior, 1976, 5, (9), 16-22.

Maslach, C. Understanding burnout: Definitional issues in analyzing a complex phenomenon. In W. S. Paine (Ed.), Job stress and burnout: Research, theory, and intervention perspectives. Beverly Hills: Sage Focus Editions, 1982a.

Maslach, C. Burnout: The cost of caring. Englewood Cliffs, NJ: Prentice-Hall, 1982b.

Maslach, C., & Jackson, S. The measurement of experienced burnout. Journal of Occupational Behaviour, 1981, 2, 99-113.

Maslach, C., & Jackson, S. E. Burnout in health professions: A social psychological analysis. In G. Sanders & J. Sils (Eds.), Social psychology of health and illness. Hillsdale, NJ: Lawrence Erlbaum, 1982.

Maslach, C., & Pines, A. Characteristics of staff burn-out in mental health settings. Child Care Quarterly, 1977, 6, 100-113.

Matsumoto, Y. S. Social stress and coronary heart disease in Japan. The Milbank Memorial Funds Quarterly, 1970, 48, 9-36.

Mattingly, M. A. Sources of stress and burn-out in professional child care work. Child Care Quarterly, 1977, 6, 127-137.

Mayer, J. E., & Rosenblatt, A. Encounters with danger. Sociology of Work and Occupations, 1975, 2, 227-245.

Miles, R. H. Individual differences in a model of organizational role stress. Journal of Business Research, 1976, 4, 87-102.

Miles, R. H., & Perreault, W. D. Organizational role conflict: Its antecedents and consequences. Organizational Behavior and Human Performance, 1976, 17, 19-44.

Moos, R. H., & Mitchell, R. E. Social network resources and adaptation: A conceptual framework. In T. A. Wills (Ed.), Basic processes in helping relationships. New York: Academic Press, 1982.

Mowday, R. T., Porter, L. W., & Steers, R. M. Employee-organization linkages: The psychology of commitment, absenteeism, and turnover. New York: Academic Press, 1982.

Mowday, R. T., & Spencer, D. C. The influence of task and personality characteristics on employee turnover and absenteeism incidents. Academy of Management Journal, 1981, 24, 634-642.

Muchinsky, P. M. Employee absenteeism: A review of the literature. Journal of Vocational Behavior, 1977, 10, 316-340.

Mueller, D. P. Social networks: A promising direction for research on the relationship of the social environment to psychiatric disorder. Social Science and Medicine, 1980, 14A, 147-161.

Myers, J. K., Lindenthal, J. J., & Pepper, M. P. Life events, social integration and psychiatric symptomatology. Journal of Health and Social Behavior, 1975, 16, 421-427.

Nicholson, N., Brown, C. A., & Chadwick-Jones, J. K. Absence from work and personal characteristics. Journal of Applied Psychology, 1977a, 62, 329-327.

Nicholson, N., Wall, T., & Lischeron, J. The predictability of absence and propensity to leave from employees' job satisfaction and attitudes toward influence in decision making. Human Relations, 1977b, 30, 499-514.

Parkes, K. R. Occupational stress among student nurses: A natural experiment. Journal of Applied Psychology, 1982, 67, 784-796.

Payne, R. L. Organizational stress and social support. In C. L. Cooper & R. Payne (Eds.), Current concerns in occupational stress. New York: John Wiley, 1980.

Pelletier, K. R. Mind as Healer, Mind as Slayer. New York: Dell, 1977.

Pines, A., & Kafry, D. Occupational tedium in the social services. Social Work, 1978, 23, 499-507.

Pinneau, S. R. Effects of social support on psychological and physiological strains. (Doctoral Dissertation, University of Michigan, 1975). Dissertation Abstracts International, 1976, 36, 5359B. (University Microfilms No. 76-9491).

Porter, L. W., & Steers, R. M. Organizational work and personal factors in employee turnover and absenteeism. Psychological Bulletin, 1973, 80, 151-176.

Prior, J. A., & Silberstein, J. S. Physical diagnosis. St. Louis: C. V. Mosby, 1973.

Rachman, S. J. Fear and courage. San Francisco: W. H. Freeman, 1978.

Ross, H. E. Behaviour and perception in strange environments. New York: Basic Books, 1974.

Sales, S. M. Some effects of role overload and role underload. Organizational Behavior and Human Performance, 1970, 5, 592-608.

Sawada, S., Ohtsuka, R., & Suzuki, S. A multivariate approach to feeling of fatigue in relation to individual workers' working and living conditions. Journal of Human Ergology, 1980, 9, 23-33

Schuler, R. S. Definition and conceptualization of stress in organizations. Organizational Behavior and Human Performance, 1980, 25, 184-215.

Schuler, R. S., Aldag, R. J., & Brief, A. P. Role conflict and ambiguity: A scale analysis. Organizational Behavior and Human Performance, 1977, 20, 111-128.

Shaw, J. B., & Riskind, J. H. Predicting job stress using data from the position analysis questionnaire. Journal of Applied Psychology, 1983, 68, 253-261.

Sherman, J. L., & Fields, S. K. Guide to patient evaluation. Flushing, NY: Medical Examination Publishing Co., 1974.

Spencer, D. G., & Steers, R. M. The influence of personal factors and perceived work experiences on employee turnover and absenteeism. Academy of Management Journal, 1980, 23, 567-572.

Spielberger, C. D. Anxiety as an emotional state. In C. D. Spielberger (Ed.), Anxiety: Current trends in theory and research. New York: Academic Press, 1972.

Spielberger, C. D., Gorsuch, R. L., & Luchene, R. E. Manual for the state-trait anxiety inventory. Palo·Alto, CA: Consulting Psychologists Press, 1970.

Staw, B. M. Motivation in organizations: Toward a synthesis and redirection. In B. M. Staw & G. R. Salancik (Eds.), New Directions in Organizational Behavior. Chicago: St. Clair Press, 1977.

Steers, R. M., & Rhodes, S. R. Major influences on employee attendance: A process model. Journal of Applied Psychology, 1978, 63, 391-407.

Stogdill, R. Handbook of leadership. New York: The Free Press, 1974.

Taylor, J. C., & Bowers, D. G. Survey of organizations. Ann Arbor: Institute for Social Research, 1972.

Thoits, P. A. Conceptual, methodological, and theoretical problems in studying social support as a buffer against life stress. Journal of Health and Social Behavior, 1982, 23, 145-159.

Tosi, H. Organization stress as a moderator of the relationship between influence and role response. Academy of Management Journal, 1971, 14, 7-20.

Tosi, H., & Tosi, D. Some correlates of role conflict and ambiguity among public school teachers. Journal of Human Relations, 1970, 18, 1068-1075.

Turner, A. N., & Lawrence, P. R. Industrial jobs and the worker. Boston: Harvard University, 1965.

Watson, C. J. An evaluation of some aspects of the Steers & Rhodes model of employee attendance. Journal of Applied Psychology, 1981, 66, 385-389.

Weiner, H. J., Akabas, S. H., & Sommer, J. J. Mental health care in the world of work. New York: Association Press, 1973.

Wells, J. A. Objective job conditions, social support and perceived stress among blue collar workers. Journal of Occupational Behaviour, 1982, 3, 79-94.

Zaleznik, A., Kets de Vries, M. F. R., & Howard, J. Stress reactions in organizations: Syndromes, causes and consequences. Behavioral Science, 1977, 22, 151-162.

Zedeck, S., Jackson, S. E., & Marca, E. S. Shift work schedules and their relationship to health, adaptation, satisfaction, and turnover intention. Academy of Management Journal, 1983, 26, 297-310.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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